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BULLETIN

OF THE

North Carolina Board of Health.

Published Monthly at the Office of the Secretary of the Board, Raleigh, N. C.

GEO. G. THOMAS, M. D., *Pres.*, Wilmington.
S. WESTRAY BATTLE, M. D., Asheville.
HENRY W. LEWIS, M. D., Jackson.
HENRY H. DODSON, M. D., Milton.

*C. J. O'HAGAN, M. D., Greenville.
J. L. NICHOLSON, M. D., Richlands.
ALBERT ANDERSON, M. D., Wilson.
A. W. SHAFFER, SAN. ENG., Raleigh.

RICHARD H. LEWIS, M. D., *Secretary and Treasurer*, Raleigh.

VOL. XVI.

APRIL, 1901.

No. 1.

County Sanitary Committees.

The County Sanitary Committee being a new body just created by the recently adjourned Legislature, we feel that it would not be amiss to call attention to the very important duty required of it in the immediate future, namely, the election of a county superintendent of health.

According to section 7 of the same the time of meeting shall be "for the election of a county superintendent of health on the first Monday in May, 1901, and every two years thereafter."

In section 5 of the Act Relating to the Board of Health, as amended, we find these words: "They (the county sanitary committee) shall elect a registered physician, not a member of the sanitary committee, to serve two years, with the title of county superintendent of health, and shall fix his compensation." This is by far the most important of the duties imposed upon the committee, for upon the character and qualifications of

the superintendent of health depends the success or failure of the administration of the law bearing on the health interests of the people of the county. The position of superintendent of health is no sinecure at any time if he does his duty, requiring as it does intelligence, conscientiousness and nerve or "back-bone." While this is particularly true during the prevalence of small-pox it is likewise true at all times, for few counties are rarely ever entirely free of a preventable disease of some kind, notably typhoid fever, scarlet fever or diphtheria. Although the principal duties of the superintendent are specifically set forth in sections 56 and 58 and others of the act, there is no specification as to typhoid fever, but in section 5 a general clause is inserted in these words: "The duty of the county superintendent of health shall be to carry out as far as possible such work as may be directed by the county sanitary committee and by the State Board of Health," to cover such sanitary work as may not have been mentioned in detail. In this

* Deceased.

connection we would respectfully suggest that the sanitary committee make it one of the specific duties of the superintendent, immediately upon the occurrence of a case of typhoid fever in his county, to apply to the Secretary of the State Board of Health for a permit for a bacteriological analysis of the drinking water of the family in which the case occurs or make it his business to see that the attending physician makes the application and has the analysis made *promptly*. The reasons for this will be found in the article following.

The responsibilities of the superintendent being great, an inferior man cannot be expected to meet them fully. We feel sure that the county authorities—the board of county commissioners is practically the county sanitary committee—cannot make a better investment for their people than in electing a good man and paying him a reasonably fair salary. In regard to this question of salary we beg leave to repeat a suggestion previously made in a circular-letter to the chairmen of the boards of commissioners to the effect that in fixing the salary of the superintendent an understanding should be had with him that if called upon to treat cases of small-pox, which would greatly cripple if not entirely destroy his private practice, for the time being and for some time thereafter, he would receive extra compensation—a certain definite amount per day or per month. This would be only simple justice, and a clear understanding on this point in the beginning would be more satisfactory to both parties. The experience of the past three years have shown that the counties having efficient superintendents cordially supported by their boards of commissioners have come out of small-pox outbreaks at much less expense than others in which the conditions were different.

In conclusion, we wish to impress upon all sanitary committees that they must elect a

county superintendent of health on the first Monday in May, 1901. No discretion is left them, but the law is mandatory.

Bacteriological Examinations.

Our readers will doubtless remember reading in these columns a few months ago a statement of the enlightened and generous offer made by our Department of Agricultural to have made in its biological laboratory free of charge bacteriological examinations of all suspected drinking waters. It is with much regret that we note the failure of our physicians to take advantage of that offer to any extent, there having been less than a half dozen applications for such examinations. It is certainly not because of a lack of typhoid fever, for we find that it was present last month in 11 counties. We are at a loss to understand the want of appreciation shown by the profession unless it is due to force of habit. It is so well known that an infected well or spring is at the bottom of most cases typhoid fever, that whenever a case occurs a warning as to the water supply is sounded. In the interest of the other members of the family in which the case occurs it is clearly the duty of the attending physician to ascertain as soon as possible the cause of the attack and, having found it, to protect the family and others liable to come within its reach against it. To do this in most instances would require very little time or trouble and the expenditure of ten cents in postage, which the family would no doubt be only too glad to pay. We sincerely hope that hereafter every physician in the State who has a case of typhoid fever will, as soon as the diagnosis is made, or even strongly suspected, write us for a permit, which, together with instructions and a sterilized bottle, will be gladly and promptly sent. While on the subject of typhoid fever we think it proper to call attention to an-

other source of infection, the fly, by copying the following short article from the last number of the Bulletin of the Bacteriological and Pathological Laboratory of the Delaware State Board of Health:

A NEWLY RECOGNIZED SOURCE OF INFECTION.

The severe epidemic of typhoid fever in our troops in the late Americo-Spanish war, as well as the numerous experiments on the subject, bring to light the important fact that typhoid fever is not only a "water-borne" but to a great extent a "fly-bred" disease. In a very able paper published in the *Popular Science Monthly*, January, 1901, ("Flies and Typhoid Fever") Dr. Howard states the following conclusions:

1. "In the army camps the latrines are not properly cared for and where their contents are left exposed, *Musca domestica* (the "house-fly") will, and does, breed in these contents in large numbers, and is attracted to them without necessary oviposition.

2. "In towns where the box privy nuisance is still in existence the house fly is attracted to such places to a certain extent, though not as abundantly as other flies, which, however, are not found in houses.

3. "In the filthy regions of a city, where sanitary supervision is lax, and where in low alleys and corners and vacant lots deposits are made by dirty people, the house-fly is attracted to the stools, may breed in them, and is thus a constant source of danger. The writer has seen a deposit, made over night in South Washington, in an alleyway swarming with flies in the bright sunlight of a June morning, temperature 92° F., and within thirty feet of this substance were the open doors and windows of the kitchens of two houses occupied by poor people."

With regards to the various species of flies the author has reached the following conclusions:

1. "Of the seventy-seven species of flies

found under such conditions that their bodies, especially their feet and their proboscides, may become covered with virulent typhoid germs, only eight are likely to carry them to objects from which they can enter the alimentary canal of man.

2. "Of these eight species, two, namely, *Lucilia coesas* and *Calliphora erythrocephala*, can very rarely carry such germs, though they may carry the germs of putrefaction and cause blood-poisoning, in lighting upon abrasions of the skin or open wounds.

3. "Four of these specimens, namely, *Homalonymia camiculans*, *Muscina stabulosa*, *Phora femorata* and *Sarcophaga trivialis*, possess some degree of importance, but their comparative scarcity in houses renders them by no means of prime importance.

4. "The common little fruit fly, *Drosophila ampelophila*, is a dangerous species.

5. "The house-fly is a constant source of danger, and wherever the least carelessness in the disposal or the disinfection of dejecta exists, it becomes an imminent source of danger."

The conclusion to be drawn from the above is plain: always thoroughly disinfect the bowel discharges (as the law requires) and bury them

A Word with Superintendents of Health.

On the first Monday in May a superintendent must be elected in every county. In many if not most instances the present incumbents will probably be re-elected, but in many others new men will come into office. We desire to call the attention of all outgoing superintendents to the importance of their turning over immediately to their successors such blanks, placards and literature as they may have on hand and particularly the little book on "Disinfection and Disinfectants," recently sent out. Of all superintendents, those re-elected as well as the new men, we make the earnest request that they promptly notify us of their election.

New Members of the State Board of Health.

His Excellency, Governor Aycock, has appointed the following gentlemen, their term of office to begin at the next meeting of the Board, which will be held in Durham at the time of the meeting of the State Medical Society, as required by law, probably during the week in May beginning with the 20th, although the local committee of arrangements has not yet announced the exact date: Drs. W. P. Ivey of Lenoir, and Richard H. Lewis of Raleigh, for six years; Drs. George G. Thomas of Wilmington, and Francis Duffy of New Bern, for four years; and Mr. J. L. Ludlow, C. E., of Winston-Salem, for two years. Saving ourself the selections are admirable, the medical members being generally recognized among the strongest men in the profession, and Mr. Ludlow being widely known not only in this State but throughout the South as a well-equipped and successful civil and sanitary engineer. But they follow excellent men, from all of whom we part officially with genuine regret.

Review of Diseases for March, 1901.

EIGHTY-NINE COUNTIES REPORTING.

Ninety-four counties have Superintendents of Health.

Except in the case of the more contagious and dangerous diseases the Superintendent has, as a rule, to rely upon his own information alone, since few physicians can be induced to report cases of non-contagious diseases to him.

Where the number of cases is not given or the prevalence of a disease otherwise indicated, its mere presence in the county is to be understood as reported.

For the month of March the following diseases have been reported from the counties named:

MEASLES.—Alamance, a few cases; Beaufort, 4; Bladen; Brunswick, several; Buncombe; Burke, in all parts; Cabarrus, many; Caldwell, 10; Carteret, several; Cherokee, 150 to 200; Clay, several; Cleveland, several; Columbus; Dare, 18; Davidson; Durham, a few; Forsyth, in all parts; Gaston; Gates, epidemic; Granville, 2; Guilford, 2; Haywood; Henderson, 13; Hyde, in all parts; Jackson, 21; Johnston; Lincoln, in all parts; McDowell; Macon, 4; Mecklenburg, 50; Mitchell, many; Montgomery, 25; New Hanover, 88; Onslow, 30; Pasquotank, a few; Pender, in all parts; Perquimans, 60; Polk, 4; Randolph, 25; Richmond, 20; Robeson, epidemic; Rutherford, in all parts; Sampson, in all parts; Scotland, 5; Stokes, 8; Swain, a few; Union, epidemic; Vance, a few; Wake, 12; Washington, 6; Yancey, many—51 counties.

WHOOPIING-COUGH.—Alamance, a few cases; Alexander; Ashe, 4; Beaufort, 2; Caldwell, 20; Craven, 6; Durham, a few; Gaston; Granville, 15; Iredell, many; Jackson, in all parts; Johnston; Lincoln, in all parts; McDowell; Madison, 75; Martin, 10; Mecklenburg, a few; New Hanover, 1; Pasquotank, a few; Polk, 1; Randolph, 10; Robeson; Rowan, 12; Surry, 6; Union, 2; Vance, a few; Wake, 14; Wayne, a few—27 counties.

SCARLET FEVER.—Buncombe, 2; Caldwell, 2; Davidson, 4; Franklin, 1; Jackson, a few; Mecklenburg, 1; Nash, 1; New Hanover, 1; Wake, 2; Washington, 6—10 counties.

DIPHTHERIA.—Ashe, 2; Brunswick, 2; Halifax, 1; Macon, 1; Wake, 3—5 counties.

TYPHOID FEVER.—Beaufort, 4; Bertie, 1; Brunswick, several; Buncombe, 2; Craven, 4; Harnett, a few; Jones, 1; Madison, 7; Orange, 1; Wake, 1—11 counties.

MALARIAL FEVER.—Caswell; Lenoir; Perquimans.

INFLUENZA.—Ashe; Beaufort; Bertie; Bladen; Cabarrus, general; Catawba; Chatham, general; Cherokee; Chowan, general; Clay; Cleveland; Currituck; Davidson; Franklin; Gates; Greene; Harnett, general; Haywood; Henderson; Iredell; Jackson, general; Jones; Lenoir, general; McDowell; Macon; Martin; general; Montgomery; Moore; Nash; New Hanover; Northampton; Onslow; Orange; Pender, general; Person; Pitt, general; Randolph; Richmond; Robeson; Rockingham; Sampson; Stokes; Surry, general; Swain; Union; Vance; Wake; Washington, general; Wayne; Yadkin, general—50 counties.

PNEUMONIA.—Ashe; Beaufort, in all parts; Bertie, in many parts; Cabarrus, in all parts; Chatham; Chowan, Davie, Gates, in all parts; Graham; Greene, in all parts; Harnett, in many parts; Hertford; Hyde; Iredell; Jackson, in all parts; Jones; Lenoir, in nearly all parts; Martin; Northampton, in all parts; Perquimans; Pitt, in all parts; Richmond; Robeson; Sampson, in nearly all parts; Stanly; Swain; Union; Wake, in all parts; Wayne; Yadkin, in nearly all parts—30 counties.

MUMPS.—Caswell, 500; Franklin, in nearly all parts; Guilford; Yadkin.

VARICELLA.—Jones, 2; McDowell; Wilson, in nearly all parts.

SIMPLE CONTINUED FEVER.—Graham.

SMALL-POX.—Buncombe, 12; Cabarrus, 8; Chatham, 5; Cleveland, 4; Davidson, 31; Durham, 38; Forsyth, 1; Greene, 17; Guilford, 7; Halifax, 1; Mecklenburg, 45; Nash, 3; Orange, 30; Pasquotank, 3; Person, 6; Polk, 2; Robeson, 13; Wake, 5—18 counties.

CHOLERA IN HOGS.—Ashe, Bertie, Chowan, Cleveland, Hyde, Lenoir.

DISTEMPER IN HORSES.—Chowan, Cleveland, Macon, Swain.

HYDROPHOBIA IN DOGS.—Caswell.

No diseases reported from Edgecombe, Warren, Watauga and Wilkes.

No reports received from Alleghany, Anson, Cumberland, Duplin and Transylvania.

Summary of Mortuary Reports for March, 1901.

(TWENTY-FIVE TOWNS).

Only those towns from which certified reports are received are included.

Aggregate population.....	White. 77,539	Col'd. 49,151	Total. 126,890
Aggregate deaths...	106	108	214
Representing temporary annual death rate per 1,000	16.4	26.4	20.2
<i>Causes of Death.</i>			
Typhoid fever.....	2	0	2
Scarlet fever.....	1	0	1
Malarial fever	2	0	2
Whooping-cough ..	0	3	3
Measles	0	1	1
Pneumonia.....	25	19	44
Consumption	13	16	29
Brain diseases.....	5	6	11
Heart diseases.....	11	9	20
Neurotic diseases...	2	2	4
Diarrhœal diseases	1	2	3
All other diseases..	41	47	88
Accident	3	2	5
Suicide.....	0	1	1
	106	108	214
Deaths under five years.....	20	19	39
Still-born.....	1	8	9

Mortuary Report for March, 1901.

TOWNS AND REPORTERS.	RACES.	POPULATION.		TEMPORARY ANNUAL DEATH RATE PER 1,000.																TOTAL DEATHS.				
		By Races.	Total.	By Races.	Total.	Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrheal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	By Races.	By Towns.	
Asheville.....	W.	9,694	14,694	22.3	22.9	1	1					4	1	1	1		8	1				18	25	9
Dr. C. V. Reynolds. }	C.	5,000		24.0										3	1	1	1		10	1				15	34	3
Charlotte.....	W.	10,691	18,091	16.8	22.5	1						1	4	1		2		10	1			19	34	3
Dr. F. O. Hawley. }	C.	7,400		30.8										1	1				10	1				15	34	4
Durham.....	W.	4,479	6,679	5.4	5.4							1	1					1				2	3	
Dr. Z. T. Brooks. }	C.	2,200		5.4																				1
Goldsboro.....	W.	3,377	5,877	17.8	18.4							3			2							5	9	
J. E. Peterson, Mayor. }	C.	2,500		19.2										1					3					4		1
Henderson.....	W.	2,046	3,746	17.6	19.2							1		1	1			3				4	3	
Dr. F. R. Harris. }	C.	1,700		21.2											1				1	2				3	6
Hillsboro.....	W.	407	707	0.0	0.0																	0	0	
Dr. C. D. Jones. }	C.	300		0.0																				0	0
Laurinburg.....	W.	834	1,334	0.0	0.0																	0	0	
Dr. A. W. Hamer. }	C.	500		0.0																				0	0
Lenoir.....	W.	1,036	1,296	11.6	9.3							1										1	1	
Dr. A. A. Kent. }	C.	260		0.0																				0	0
Marion.....	W.	766	1,116	78.3	53.8							2	1		1				1			5	5	1
Dr. B. A. Cheek. }	C.	350		0.0																				0
Monroe.....	W.	1,827	2,427	0.0	0.0																	0	0	
Dr. J. M. Blair. }	C.	600		0.0																				0
Morgantown.....	W.	1,438	1,938	16.7	18.6								1		1							2	3	
H. B. Smith, Clerk. }	C.	500		24.0															1					1	3
Oxford.....	W.	1,159	2,059	10.3	11.6									1				1				1	2	
Dr. S. D. Booth. }	C.	900		13.3											1					1				1	2
Raleigh.....	W.	8,643	13,643	19.4	25.5								1	4	3			6				14	29	1
T. P. Sale, Clerk B. H. }	C.	5,000		36.0					3					1	1	2				9				15	7
Reidsville.....	W.	2,000	3,260	30.0	36.8							1					1	3				5	10	
J. T. Smith, Clerk. }	C.	1,260		47.6										1	2				1	1				5	10
Rockingham.....	W.	1,007	1,507	23.8	63.7							1	1									2	8	
Dr. J. M. Ledbetter. }	C.	500		14.4										3		1			2					6
Rocky Mount.....	W.	1,837	2,937	0.0	12.2										1							0	3	
Dr. G. L. Wimberley, Jr. }	C.	1,100		32.7													1		2					3
Salem.....	W.	3,242	3,642	7.4	9.9							2										2	3	
S. E. Butner, Mayor. }	C.	400		30.0										1						1				1
Salisbury.....	W.	4,277	6,277	0.0	7.6																	0	4	
Dr. W. W. McKenzie. }	C.	2,000		11.2										1		1			2					4	2
Scotland Neck.....	W.	900	1,348	0.0	0.0																	0	0	
Dr. J. P. Wimberly. }	C.	448		0.0																				0	0
Tarboro.....	W.	2,000	2,500	0.0	0.0																	0	0	
Dr. L. L. Staton. }	C.	500		0.0																				0
Warrenton.....	W.	536	836	0.0	28.7																	0	2	
Dr. P. J. Macon. }	C.	300		80.0										1	1									2	1
Washington.....	W.	2,842	4,842	12.7	22.3							1	1				1					3	9	
Dr. Jno. G. Blount. }	C.	2,000		36.0										1	2				1	2				6	9	1
Weldon.....	W.	700	1,433	17.1	25.1										1							1	3	
J. T. Gooch, Mayor. }	C.	733		32.7										1					1					2	3
Wilmington.....	W.	9,976	20,976	27.7	24.6		2					5	2	1	4	2	7					23	43	3
Dr. Chas. T. Harper. }	C.	11,000		21.8										4	3	2	2	2	6	1				20	43	4
Wilson.....	W.	1,825	3,525	26.3	30.6							1					3					4	9	3
Dr. W. S. Anderson. }	C.	1,700		35.3										2					2	1				5	9	3

N. B.—The reporters for the cities and towns printed in **Black Type** have signed this certificate: "I hereby certify that this report gives the *whole* number of deaths occurring within the corporate limits during the above month." The total populations are taken from the census report for 1900, but the division into races is estimated, as those figures have not been given out.

County Superintendents of Health.

Alamance	Dr. T. S. Faucette.	Jones	Dr. S. E. Koonce.
Alexander	Dr. T. F. Stevenson.	Lenoir	Dr. W. T. Parrott.
Alleghany	Dr. B. C. Waddell.	Lincoln	Dr. T. F. Costner.
Anson	Dr. E. S. Ashe.	McDowell	Dr. B. A. Cheek.
Ashe.....	Dr. Manley Blevins.	Macon	Dr. F. L. Siler.
Beaufort	Dr. P. A. Nicholson.	Madison	Dr. Jas. K. Hardwicke.
Bertie	Dr. H. V. Dunstan.	Martin.....	Dr. W. H. Harrell.
Bladen.....	Dr. Newton Robinson.	Mecklenburg.....	Dr. F. M. Winchester.
Brunswick	Dr. J. A. McNeill.	Mitchell.....	Dr. V. R. Butt.
Buncombe.....	Dr. James Sawyer.	Montgomery	Dr. M. P. Blair.
Burke.....	Dr. J. L. Laxton.	Moore.....	Dr. Gilbert McLeod.
Cabarrus.....	Dr. D. G. Caldwell.	Nash	Dr. J. P. Battle.
Caldwell.....	Dr. A. A. Kent.	New Hanover	Dr. W. D. McMillan.
Camden.....		Northampton.....	Dr. H. W. Lewis.
Carteret	Dr. F. M. Clark.	Onslow.....	Dr. E. L. Cox.
Caswell	Dr. S. A. Malloy.	Orange.....	Dr. C. D. Jones.
Catawba.....	Dr. Geo. H. West.	Pamlico.....	
Chatham.....	Dr. H. T. Chapin.	Pasquotank	Dr. H. T. Aydlett.
Cherokee.....	Dr. J. F. Abernathy.	Pender.....	Dr. L. L. Ardrey.
Chowan.....	Dr. T. J. Hoskins.	Perquimans.....	Dr. C. C. Winslow.
Clay	Dr. J. M. Sullivan.	Person	Dr. J. A. Wise.
Cleveland	Dr. B. H. Palmer.	Pitt.....	Dr. C. O'H. Laughing-
Columbus.....	Dr. I. Jackson.		house.
Craven.....	Dr. R. DuVal Jones.	Polk	Dr. Earle Grady.
Cumberland.....	Dr. J. Vance McGougan.	Randolph	Dr. T. T. Ferree.
Currituck.....	Dr. H. M. Shaw.	Richmond.....	Dr. J. M. Ledbetter.
Dare	Dr. W. B. Fearing.	Robeson	Dr. H. T. Pope.
Davidson.....	Dr. Joel Hill.	Rockingham	Dr. Sam Ellington.
Davie	Dr. James McGuire.	Rowan	Dr. W. L. Crump.
Duplin.....	Dr. James W. Blount.	Rutherford.....	Dr. W. A. Thompson.
Durham.....	Dr. Z. T. Brooks.	Sampson	Dr. R. E. Lee.
Edgecombe	Dr. L. L. Staton.	Scotland	Dr. A. W. Hamer.
Forsyth.....	Dr. John Bynum.	Stanly.....	Dr. V. A. Whitley.
Franklin	Dr. E. S. Foster.	Stokes	Dr. W. V. McCanless.
Gaston.....	Dr. J. H. Jenkins.	Surry	Dr. John R. Woltz.
Gates.....	Dr. W. O. P. Lee.	Swain.....	Dr. J. A. Cooper.
Graham.....	Dr. R. J. Orr.	Transylvania	Dr. C. W. Hunt.
Granville.....	Dr. S. D. Booth.	Tyrrell.....	
Greene.....	Dr. Joseph E. Grimsley.	Union.....	Dr. J. E. Ashcraft.
Guilford.....	Dr. Edmund Harrison.	Vance.....	Dr. Goode Cheatham.
Halifax	Dr. I. E. Green.	Wake.....	Dr. J. J. L. McCullers.
Harnett.....	Dr. O. L. Denning.	Warren.....	Dr. A. S. Pendleton.
Haywood	Dr. F. M. Davis.	Washington	Dr. W. H. Ward.
Henderson.....	Dr. J. G. Waldrop.	Watauga.....	Dr. E. F. Bingham.
Hertford	Dr. John W. Tayloe.	Wayne.....	Dr. Williams Spicer.
Hyde	Dr. E. H. Jones.	Wilkes.....	Dr. J. M. Turner.
Iredell	Dr. Henry F. Long.	Wilson	Dr. W. S. Anderson.
Jackson.....	Dr. Wm. Self.	Yadkin	Dr. S. L. Russell.
Johnston	Dr. L. D. Wharton.	Yancey	Dr. W. M. Austin.

[You are asked to fill out and mail one of these forms to the Superintendent of Health of your county on or before the third of each month, that he may use it in making his report to the Secretary of the State Board.] •

Have any of the following diseases occurred in your practice during the month just closed. If so, state number of cases.

Whooping-cough Typhoid Fever

Measles Typhus Fever

Diphtheria Yellow Fever.....

Scarlet Fever Cholera

Pernicious Malarial Fever..... Smallpox.....

Hemorrhagic Malarial Fever Cerebro-spinal Meningitis.....

What have been the prevailing diseases in your practice?

.....

Has any epidemic occurred among domestic animals? If so, what?

.....

What is the sanitary condition of your section, public and private?

.....

.....

General Remarks:

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.....M. D.

BULLETIN

OF THE

North Carolina Board of Health.

Published Monthly at the Office of the Secretary of the Board, Raleigh, N. C.

GEO. G. THOMAS, M. D., *Pres.*, Wilmington.
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RICHARD H. LEWIS, M. D., *Secretary and Treasurer*, Raleigh.

VOL. XVI.

MAY, 1901.

No. 2.

Influenza as a Factor of Recent Mortality.

In view of our own experience during the past winter and spring in the unusual mortality from pneumonia, very often as a feature of influenza or *la grippe*, we feel that no apology is required for devoting a large part of our space to the following very interesting and instructive discussion of the above subject which we find in the *Monthly Bulletin* for March of the Department of Health of the City of Chicago:

INFLUENZA AS A FACTOR OF RECENT MORTALITY.

Pneumonia has displaced the "Great White Plague"—pulmonary consumption—as the principal cause of death in Chicago during the last ten years. In the previous half century consumption had levied the heaviest toll on human life in this city, but

in the decade 1891-1900 there were nine per cent. more deaths from pneumonia than from consumption.

Between 1851 and 1890, inclusive, during which period deaths and their causes were recorded with increasing accuracy and fullness, there were 25,719 deaths from consumption and 16,577 from pneumonia—9,182, or more than thirty-five per cent. excess of consumption deaths. Between 1891 and 1900, inclusive, there were 22,957 deaths from consumption and 25,228 deaths from pneumonia—2,271, or nine per cent. excess of pneumonia deaths.

In the decade 1881-1890 there were 147,514 deaths recorded from all causes—out of which number there were 9,915 from pneumonia, or 672 deaths from this cause out of every 10,000 deaths from all causes.

In the last decade, 1891-1900, there were 247,240 deaths recorded from all causes, including 25,228 deaths from pneumonia—or 1,019 deaths from pneumonia out of every 10,000 deaths from all causes.

*Deceased.

In the former decade the death rate of pneumonia was 12.36 per 10,000 of population. In the last decade this death rate was 18.03 per 10,000 of population.*

The foregoing figures show an increase of nearly forty-six (45.8) per cent. in proportion to population and of more than fifty (51.6) per cent. in the actual number of pneumonia deaths in the last over the previous decade.

Death rates of pneumonia advance enormously with advancing age—roughly, in this country from 100 in every 10,000 of the population living between fifteen and forty-five years, to 260 of those between forty-five and sixty-five, and to 730 of those over sixty-five years of age—and some part of this Chicago increase is unquestionably due to the increasing age of its population. This increase, however, is generally uniform from one decade to another. In 1850 only two per cent. of the population was over 60 years of age; in 1860 there was 2.6 per cent.; in 1870, 3.2 per cent.; in 1880, 3.6 per cent., and in 1890, 3.8 per cent. The rates of increase of this factor of the population in the successive decennial years over the proportion in 1850 were, therefore, 30 per cent. in 1860; 60 per cent. in 1870; 80 per cent. in 1880; and 90 per cent. in 1890.†

During the thirty years 1861–1890, inclusive, the death rates from pneumonia bear some relation to this rate of increase. In the decade 1861–1870 these deaths formed 3.9 per cent. of the total deaths from all causes; in the two succeeding decades they were respectively 5 and 6.7

per cent. of the total deaths. In the 1861–70 decade they were at the rate of 92 deaths per 100,000 of population; in 1871–80 at the rate of 107 and in 1881–90 at the rate of 123 per 100,000.

But in the last decade, 1891–1900, these proportions rose to more than ten (10.2) per cent. of the total deaths from all causes (as against an average of 4.4 per cent. for the previous forty years), and to 180 (as against a previous average of 96 for the same period) per 100,000 of population. Compared with the immediately preceding decade, 1881–1890, there was an increase in the last decade of nearly forty-six (45.9) per cent. of pneumonia deaths in proportion to population, while the increase in the decade 1871–1880 was less than seventeen (16.5) per cent., and in the next decade, 1881–1890, it was less than sixteen (15.6) per cent.

On the basis of the proportion of pneumonia deaths to deaths from all causes the increase in the last decade over the previous one is 52.2 per cent. and over the average annual increase of the previous thirty years it is nearly sixty-eight (67.8) per cent. Obviously, the increasing pneumonia mortality of the last decade is not due solely nor chiefly to the increasing age of the population.

During this same period, 1891–1900, the death rate of consumption, which had steadily declined from 30.48 per 10,000 of population in 1851–60 to 15.88 in 1881–90, rose to 16.41 in the last decade—an increase of 3.3 per cent.; the bronchitis rate increased 8.4 per cent.; while the death rate from diseases of the heart and circulatory system increased 22 per cent.—or from 63 to 77 per 10,000 of population—and from nephritis nearly 85 per cent., or from 32 to 59 per 10,000 population. Only the death rate from diseases of the nervous system, out of these five principal causes of death, shows a

*Wherever population figures are used in this article they are those of the United States Census in every instance—beginning with that of 1850. "Estimated population," population by State, School or City census, by directory publishers, by the "Two Million Club," *et al.*, are disregarded for present purposes.

†Population by ages has not yet been furnished by the Census Office for 1900.

reduction during the last decade—to wit: from 27 to 22 per 10,000 of population, a reduction of 18.5 per cent.

The rate of reduction in the general death rate, which had obtained during the previous forty years, also suffered a material check during this period. In the decade 1851-60 the average annual death rate was 35.72 per thousand; from 1861 to 1870 it was 23.35 per thousand—a reduction of 34.6 per cent.; between 1871 and 1880 the rate was 21.16—a reduction of 9.4 per cent. from that of the previous decade; and between 1881 and 1890 the rate fell to 18.40—a further reduction of 13 per cent. The gross reduction during the forty years was a little more than 48 per cent. and the average reduction of each decade was 19 per cent.

But between 1891 and 1900 there were 247,240 deaths in an average annual population of 1,399,212—an annual rate of 17.69 per thousand and a reduction of only 3.8 per cent. from the rate of the preceding decade as against a minimum reduction of 9.4 per cent. an average reduction of 19 per cent., in the three previous decades.

In October, 1899, the fourth great pandemic of influenza began—"as others had done before, in some of the distant provinces of Russia, and by the beginning of November it had reached Moscow. By the middle of November Berlin was attacked. By the middle of December it was in London and by the end of the month it had invaded New York and was widely distributed over the entire continent." Thus Osler; but even his graphic summary fails to convey an adequate idea of the rapidity of its march. First heard of in Central Asia in October, within two months it had caused death in Chicago and within three months "it had reached its height in our city, at which time (the last week in January, 1899) my belief is that over 100,000 of our citizens were sufferers from that cause alone."*

From the single influenza death in December, 1899, the number rose to 64 in January, 1890, fell to 37 in February, rapidly dropped to 2, 7, 1 and 1 respectively in the next four months, after which there was a lull until January, 1891, when there were 4 more deaths, 6 in February, 155 in March, 120 in April, dropping 23, 4, 1, 3, 2, 0, 2 and 16 respectively in the remaining months, with a total of 336 influenza deaths recorded during the year.

This actual mortality, however, very inadequately represents the import of epidemic influenza to the public health. Its baleful effects in the two years are more clearly seen in the following figures:

	1889	1890	1891
Total deaths from all causes...	16,946	21,856	27,754
Rates per 1,000 population...	18.11	19.86	23.92
Total deaths from pneumonia...	11.70	20.73	28.98
Rates per 10,000 population...	12.5	18.8	25.0
Total deaths from consumption, 14.89	19.72	21.20	
Rates per 10,000 population...	15.9	17.9	18.3
Total deaths from bronchitis...	8.16	11.89	14.95
Rates per 10,000 population...	8.7	10.8	12.9

The total deaths from all causes in 1891, the second influenza year, are the highest in number ever recorded in the history of the city up to date, and are nearly one-third greater in proportion to population than in 1889. The consumption death rate increased 15 per cent., the bronchitis rate one-half and the pneumonia rate exactly doubled in two years. Deaths from nephritis and from heart diseases also markedly increased, but not to the same extent as in the later years of the decade.†

*Swayne Wickersham, M. D., Commissioner of Health, in Annual Report of the Department of Health for the year of 1900.

†The permanent increase of consumption mortality, also, was not marked until 1894, the fifth year of the influenza period. During the previous seven years, 1887-1893, inclusive, the consumption mortality formed 8.5 per cent. of the total mortality, and was at the rate of 154 per 100,000 of population. From 1894 to 1900, inclusive, it formed 9.8 per cent. of the total—an increase of 15.5 per cent. in proportionate mortality—and was at the rate of 186 per 100,000 of the population, an increase of 9 per cent. population proportion in the second seven year period.

The cause of the delay in the increase of consumption mortality due to influenza, as compared with the increase of pneumonia, is obvious. The former disease is chronic, the later acute. Lesions of the mucous membrane of the nose, throat and air passages in the prevailing catarrhal bronchitis of influenza and of the air cells in pneumonia permitted the invasion of the tubercle bacillus *de novo*, while the characteristic prostration of the disease and consequent impaired vital resistance favored the development and activity of latent bacilli already in the system. Even a mild attack of influenza has often been the starting point of a fatal attack of tuberculosis.

There was a marked subsidence of the disease during 1892, in which year 103 deaths were referred to influenza—none during the last seven months—and it was hoped that the epidemic had ended; but there was a recrudescence in 1893, with 88 deaths in the latter year and 51 in the year 1898.

In the winter of 1894-95 the Commissioner called attention to these facts, and suggested that, in view of the demonstration by Canon and Pfeiffer in 1892 of the microbial origin of the disease, its bacteriologic diagnosis was a matter of first importance, and especially so since influenza simulated so many other diseases. Physicians were invited to send specimens from the throats of suspected influenza patients to the Laboratory for examination and the Department bacteriologists were requested to make a special study of the bacillus.

Owing to the subsidence of the disease in 1896 and 1897—when there were only 17 and 15 influenza deaths respectively—no opportunity was afforded for the proposed study and interest in the subject died out. In the latter part of 1897, however, the disease reappeared and 21 deaths from influenza were recorded during the month of January, 1898. In the Department Bulletin for that month the following statement was published:

Verified returns for the month of January, 1898, as compared with the corresponding month of 1897, show that there were 193 fewer deaths during the month, the respective totals being 2,026 and 1,833. The decrease is entirely among children under five years of age, of whom 888 died in January a year ago and only 605 in the corresponding month this year. This is a decrease of nearly one-third. On the other hand, the deaths among the middle-aged and beyond are in excess—an excess caused chiefly by chronic diseases, such as consumption, heart disease, Bright's disease, etc., to which must be added 21 deaths from *influenza* or *la grippe*, as against a total of 15 for the entire year 1897.

Although this much-dreaded malady has not again spread with its usual rapidity nor yet assumed epidemic proportions in Chicago, the Department is not entirely reassured as to its future. It is noted that in London, Rome and in certain places in France, where the disease has been sporadic for some time past, it is becoming epidemic and in some cases is assuming a gravity which is very alarming.

These considerations led the Commissioner to make the following statement to the public toward the close of the month:

"After a period of unprecedented good health and low death rate Chicago is threatened with an epidemic visitation of one of the diseases most dreaded by sanitarians. Against influenza or grippe the preventive measures of sanitation and public hygiene are powerless. As a recent writer says: 'We can see it afar off and trace its progress, but can do nothing to stop it; and it smites the sanitarily pure with a severity on the whole much the same as it shows to the rest of the world. The Department has been anxiously watching its progress in the city for several weeks, hoping that there might be some mistake in the diagnosis, since it so closely resembles some other diseases. But this hope was swept away by the reports of eight deaths from the 'strange and terrible disease' during the last three days of the week just closed (Jan. 22d). These were reported by physicians of such eminence and experience as to leave no room for doubt. Three of the deaths were from the uncomplicated form of the disease, but the remaining five showed the characteristic malignant activity of the poison in fatal complications of pneumonia, apoplexy and nephritis.

"The last epidemic of this disease in Chicago was a chief factor in increasing the total deaths from 21,856 in 1890 to 27,754 in the epidemic year, 1891—an increase of more than one-fifth—and numbers of the survivors have never since re-

gained their former condition of mental and physical health. This added terror of the disease makes it all the more important that nothing should be neglected which may tend to its restriction, and to this end the Commissioner points out that influenza or the 'grip' is a germ disease, and therefore contagious. Hence the obvious thing to do is to follow the advice of the authorities: Keep out of the way of contagion.

The quotations that follow are from the article *Influenza* in Allbutt's *System of Medicine*, by J. F. Goodhart, M. D., M. C., F. R. C. P., Physician to Guy's Hospital, London, Eng., etc.:

"Where strict isolation has been possible, as in certain institutions, the disease has seldom appeared; most risk of catching the disease is run in public buildings or ill-ventilated rooms of any sort, a street car or railway carriage with closed windows not excepted. By 'keeping out of the way of the contagion' is meant, among other things, avoiding close contact with one suffering from the disease; do not sleep in the same room, still less in the same bed, with such a sufferer, and do not use any article or utensil in common with such.

"It is also certain that all kinds of excesses in living, as well as exposure and fatigue, invite attacks of the disease. 'All observers have testified to its frequency and to its heavy mortality, in the alcoholic particularly, and also in the overworked and harrassed.' They are further agreed that self-dosing with so-called influenza cures and specifics is not only useless but positively dangerous, and that mildness of attack and speedy recovery are best insured by taking to bed at once and following the advice of a competent physician. 'It is the worst folly to struggle on with work and to attempt to fight the disease—a plan that, although some came through successfully (in the past epidemic), was nevertheless the cause of the loss of many lives.' This is of especial importance to those beyond middle age with crippled hearts, kidneys or other vital organs,

"In some respects influenza resembles consumption in its mode of propagation; therefore, the same precautions with regard to the secretions from the nose, mouth and throat should be observed. These secretions literally teem with the influenza bacillus and they should be immediately destroyed or thoroughly disinfected under the advice of the attending physician. The rooms, bedding, clothing, etc., of influenza patients should also be thoroughly disinfected and the Department will perform such disinfection whenever notified.

"Thus far the diagnosis of influenza in Chicago rests entirely upon the clinical symptoms. Only a very few specimens of the throat secretions or the expectorate of alleged influenza patients have been sent to the Laboratory in response to the invitation of the Commissioner, and microscopic examination of these has thus far failed to reveal the presence of the Canon-Pfeiffer bacillus, in any instance. Yet Kamen reports failing to find the influenza germ in only one case out of a hundred examined. The Commissioner renews his request to physicians attending influenza patients to send specimens of the throat secretions and expectorate of their patients either to the Main Laboratory or to any of the sub-laboratories, where they will be put under the microscope at once and the result of the examination telephoned without delay."

It was not, however, until the early part of the following December (1898) that the influenza bacillus was first identified in the Department Laboratory and then only in examinations of suspected diphtheria—no specimens from influenza cases having been received. Once identified the organism was found with increasing frequency, and in the Department Bulletin for January, 1899, Dr. Wynekoop, Assistant Bacteriologist in charge of bacterial diagnosis, contributed the results of his study of upwards of a hundred examinations and demonstrated the feasibility—through certain improvements in technique—of the bacteriologic diagnosis of influenza with as much certainty and as promptly as diphtheria is diagnosed. Since that time, December, 1898, the search for the Canon-Pfeiffer bacillus has been as much a part of the routine of that branch of the Laboratory work as is the identification of the Klebs-Loeffler, the Eberth, the Koch, or the diplococcus of Class.

The germ has now been found in uncomplicated influenza, in bronchitis, conjunctivitis, consumption, diarrheal disease, diphtheria, empyema, endocarditis, meningitis, nephritis, otitis media, parotitis, pneumonia, scarlet fever, tonsillitis and whooping-cough;

and also in cases simulating cerebro-spinal fever, lumbago, rheumatic fever and typhoid fever.

What this pestilent organism is capable of doing, how protean its manifestations, and how mischievously puzzling the strictly clinical diagnosis—may be seen in the following:

About February 16th ult. (1899) a boy of seven suddenly became ill with a chill, of short duration, followed by headache and a temperature of 103.4° F. For a number of days prior to the chill there had been a condition closely resembling typhoid—general languor, loss of appetite, coated tongue, constipation, slight headache, nose-bleed and a slight cough. The second day following the chill the temperature rose to 105.6° F. and the pulse to 160. There were delirium, stupor and slight convulsions—symptoms suggestive of meningitis, but which could not be interpreted as such in the absence of any muscular rigidity. The temperature continued near 105° F. another twenty-four hours, when a slight erythema appeared over parts of the body.

A consultation was called, but a positive diagnosis was not made. Scarlet fever with a delayed rash was suggested, and a hot pack ordered with the hope of bringing out the rash should this be the nature of the disease. The results were negative. A microscopic examination was then made of the contents of the throat, and the presence of great numbers of influenza bacilli was revealed.

The child was now treated for influenza with prompt and decided improvement, the temperature falling to 102-101° F. and the pulse to 120-116. The cough continued, however, and became more harsh and distressing. No involvement of the lungs or pleura could be discovered at this time.

During the following two weeks the typhoid symptoms continued. Temperature varied from 100 to 103° F.; cough less pronounced; intestines greatly distended with gas; iliac tenderness and stools of a typhoid character. The nervous symptoms however, were not those of typhoid, the child being supersensitive to the touch, and exhibiting an abnormally active mental condition. A consulting physician was again called in, who made a tentative diagnosis of typhoid fever complicated by influenza. Widall's test was made on several occasions, but at no time was a satisfactory reaction obtained. What seemed to be a partial reaction about the eighteenth day could not be obtained later. Bacteriologic examinations were

made of the stools, and, after several attempts, the influenza organism was isolated, which would lead to the conclusion that this organism alone was responsible for the intestinal symptoms. On the tongue there were several small ulcers and similar patches were noticed on the mucous membrane of the lips and cheeks.

During the second week the Eustachian tubes became affected, and later the cavities of the middle ear. The otitis media ran the usual course. Pus examined at the time of the rupture of the tympanum contained the influenza bacillus, and cultures made from the discharge revealed the organism present in a pure condition. In cultures examined at a later period there were found streptococci. The intestinal symptoms disappeared during the third week and the stools became normal, but the temperature, which for several days had been in the neighborhood of 100° F., began to rise a little each day, and respiration became more rapid. This condition was found to be due to an involvement of the right pleura. Fluid began to accumulate and soon the entire chest cavity of the affected side was filled. Aspiration demonstrated the presence of pus. Microscopic examinations made of the aspirated fluid revealed the influenza organism. Small portions of the pus were transferred to blood serum and cultures obtained in which the bacillus in question was found in a pure state.*

Influenza has, apparently, become domesticated with us, and its baleful effects on the health are sufficiently shown in the foregoing facts and figures. Its early recognition is the necessary first step to any restriction of its spread—to say nothing of its scientific medical treatment. Laboratory facilities for such recognition are not adequately utilized. The profession, as a whole, manifests a singular indifference to the opportunities offered.

Before the recent recrudescence the bacillus was detected in the Department Laboratory in October, 1900, but it was not until deaths from the disease had occurred in the following December that any demand was made for examinations. Meanwhile, no

*Further Study of the Influenza Bacillus. Monthly Bulletin, Department of Health: Chicago, March, 1899.

precautions against a contagion which spreads with almost lightning-like rapidity were enforced. They were not enforced because the disease and, consequently, the necessity for precautions, were not recognized.

The way to fight influenza is through the culture tube and the microscope.

Municipal Sanitation in the United States.

We have recently received from the author, Charles V. Chapin, M. D., Superintendent of Health, Providence, R. I., a very handsome volume of the above title of nearly 1,000 pages, 113 illustrations, beautifully printed on fine paper. Accompanying the book was a note from Dr. Chapin, in which he says: "I shall feel greatly honored if you consider it worthy of notice in your monthly bulletin." We are glad to say that we consider it eminently "worthy of notice," for while we have not been able to read it carefully, we have examined it sufficiently to note with approval the following announcement by the publishers, Snow and Farnham, Providence:

"This volume deals with the practical application of the principles of sanitary science. It is not concerned with the theory of sanitation, but narrates what is being done in the United States along the lines of public health work, and will prove of great value to all who are interested in this subject. It is also a work of reference for students of social science and municipal affairs. In this book health officials will find answers to the questions that they are continually asking as to what is being done in other communities. The extracts from

statutes and ordinances which have been included, and the blank forms illustrating public health procedures shown in the appendix, render the work unique, and one which no health officer can afford to be without."

A better idea of the scope of the book can perhaps be obtained from the headings of the fourteen chapters, which are in order as follows: Sanitary Organizations—Registration of Vital Statistics—Nuisances—Specific Nuisances—Plumbing—Water, Ice, and Sewers—Food, other than Dairy Products—Dairy Products—Communicable Diseases, and one chapter entitled Legislation—Administrative Work—Disinfection, Laboratory Work, Vaccination, Antitoxin—concluded with a consideration of hospitals for such diseases, ambulances, quarantine both maritime and inland—Refuse Disposal—Miscellaneous Sanitary Work, which includes among other things, diseases of animals, school hygiene, control of barbers, prevention of blindness, nursing-bottles, kerosene, sick poor and finances.

The special value of this publication lies in the fact that it tells in a clear manner how sanitary work is actually done to-day in our country. The best way in the world to learn how to do anything is to find out how others who are experts in the business do it. For that reason we cordially commend it to our health officers, and especially to our cities and towns, that those which are already doing good sanitary work may do better and that those which are doing practically nothing may begin and begin right. In our judgment they could not make a better investment than in the purchase of "Municipal Sanitation in the United States," Snow and Farnham, Publishers, Providence, R. I. \$5, postpaid.

Review of Diseases for April, 1901.**EIGHTY-NINE COUNTIES REPORTING.**

Ninety-four counties have Superintendents of Health.

Except in the case of the more contagious and dangerous diseases the Superintendent has, as a rule, to rely upon his own information alone, since few physicians can be induced to report cases of non-contagious diseases to him.

Where the number of cases is not given or the prevalence of a disease otherwise indicated, its mere presence in the county is to be understood as reported.

For the month of April the following diseases have been reported from the counties named:

MEASLES—Alamance, several cases; Beaufort, 4; Brunswick, many; Buncombe, 2; Burke, many; Cabarrus, many; Caldwell, 6; Chatham, a few; Cleveland, many; Columbus, in all parts; Currituck, 3; Gaston, many; Gates, a few; Granville, 8; Guilford, 3; Henderson, 13; Hyde, in all parts; Jackson, 24; Johnston, many; Lincoln, 12; Mecklenburg, 30; Moore, several; New Hanover, 36; Onslow, 75; Pasquotank, a few; Perquimans, 40; Polk, 3; Richmond, epidemic; Robeson, epidemic; Rockingham; Scotland, 1; Stanly, 12; Stokes, 5; Union, epidemic; Wake, 8; Warren, 5; Watauga; Yadkin, several; Yancey, many—39 counties.

WHOOPING COUGH—Alamance, a few; Alexander, many; Beaufort, 3; Burke, many; Caldwell, 10; Chatham, a few; Chowan, several; Currituck, a few; Graham, several; Granville, 11; Iredell, a few; Johnston, many; Lincoln, 12; Mecklenburg, 50; Mitchell, several; New Hanover, 2; Onslow, 20; Pasquotank, a few; Perquimans, 15; Polk, 1; Rockingham; Scotland, 3; Stanly, 10; Surry, 4; Swain, 10; Vance,

several; Wake, 30; Watauga; Wayne, a few; Wilson; Yadkin, general; Yancey, many—32 counties.

SCARLET FEVER—Buncombe, 1; Craven, 1; Davidson, 7; Guilford, 1; Mecklenburg, 20; New Hanover, 2; Rockingham 1—7 counties.

DIPHTHERIA—Cabarrus, 1; Davie, 4; Franklin, 1; Richmond, 2—4 counties.

TYPHOID FEVER—Clay, 1; Harnett, a few; Jackson, 1; Johnston, 1; Madison, 4; Onslow, 1; Orange, 1; Polk, 1; Robeson; Rockingham; Stanly, 4; Swain, 1; Union, 2; Vance, a few; Yancey, 1—15 counties.

MALARIAL FEVER—Cabarrus; Craven; Guilford; Iredell; Lenoir; New Hanover; Onslow; Orange, a few; Perquimans, in all parts; Rockingham; Wayne—11 counties.

MALARIAL FEVER—HEMORRHAGIC—Cabarrus, 1; Craven, 1; Onslow, 1.

INFLUENZA—Alleghany; Ashe; Cabarrus, a few; Catawba; Chatham, a few; Cleveland, a few; Currituck, a few; Duplin; Gaston, a few; Graham; Greene, in all parts; Jackson; McDowell; Madison, in all parts; Mitchell; Person, a few; Richmond; Robeson; Sampson; Stokes; Transylvania; Union; Warren—23 counties.

BOWEL DISEASES—Harnett; New Hanover; Scotland.

HYDROPHOBIA—Alleghany, 1, a child, died seven weeks after being bitten.

MENINGITIS—Jackson, 1.

MUMPS—Alamance; Cabarrus, a few; Columbus, in all parts; Gaston, many; Guilford; Lincoln, in all parts; Wayne—7 counties.

PNEUMONIA—Alleghany; Currituck, 2; Franklin, 3 or 4; Graham, several; Granville, in many parts; Greene, in all parts; Lenoir; Madison, in all parts; Mitchell; Perquimans, 8; Person, a few; Robeson; Scotland; Swain; Union; Warren; Yadkin—17 counties.

RHEUMATISM—Mitchell.

VARICELLA—Cherokee, 8 or 10; McDowell; Wilson.

SMALL-POX—Buncombe, 23; Cabarrus, 5; Caswell, 9; Chatham, 13; Cleveland, 2; Davidson, 10; Durham, 27; Forsyth, 1, death; Greene, 6; Guilford, 23, last case now discharged; Halifax, 2, none now; Johnston, 15; Mecklenburg, 20, one at present; Nash, 1; Orange, 6; Person, 8; Polk, 2; Robeson, 2; Rockingham, 1; Stanly, 3; Wake, 28—21 counties.

CHOLERA IN CHICKENS—Perquimans; Rockingham.

CHOLERA IN HOGS—Ashe; Bertie; Chowan; Lenoir.

DISTEMPER IN HORSES—Burke; Cleveland; Graham; Swain.

HYDROPHOBIA, IN DOGS—Brunswick.

PINK-EYE IN HORSES—Wilkes.

No diseases reported from Bladen, Carteret, Dare, Edgecombe, Haywood, Jones, Northampton, Pitt, Randolph, Rowan,utherford and Washington.

No reports received from Anson, Cumberland, Hertford, Montgomery and Pender.

**Summary of Mortuary Reports for
April, 1901.**

(TWENTY-FOUR TOWNS).

Only those towns from which certified reports are received are included.

Aggregate popula- tion.....	White.	Col'd.	Total.
Aggregate deaths...	77,594	47,367	124,961
Representing tem- porary annual death rate per 1,000	77	87	164
	11.9	22.0	14.2

Causes of Death.

Malarial fever	1	1	2
Whooping-cough ..	0	1	1
Measles	1	0	1
Pneumonia.....	10	12	22
Consumption	10	14	24
Brain diseases.....	6	6	12
Heart diseases.....	7	5	12
Neurotic diseases...	0	3	3
Diarrhoeal diseases	3	8	11
All other diseases..	36	34	70
Accident	2	3	5
Violence	1	0	1
	77	87	164

Deaths under five years.....	27	18	45
Still-born.....	4	6	10

Mortuary Report for April, 1901.

TOWNS AND REPORTERS.	RACES.	POPULATION.		TEMPORARY ANNUAL DEATH RATE PER 1,000.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrhoeal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	TOTAL DEATHS.		Deaths under five years.	Still-born.
		By Races.	Total.	By Races.	Total.																	By Races.	By Towns.		
Asheville.....	W.	9,694	14,694	18.6	25.3	...	...	...	...	...	...	2	1	2	2	...	1	5	...	...	15	31	...	...
Dr. C. V. Reynolds.	C.	5,000		38.4		...	...	...	...	...	...	1	1	2	...	...	...	...	...	...	16	...	...	...
Charlotte.....	W.	11,991	18,091	17.0	12.9	...	...	...	...	...	...	3	2	...	1	...	...	9	...	...	17	29	5	2
Dr. F. O. Hawley.	C.	6,100		23.6		...	...	...	...	...	...	4	1	1	...	...	...	1	...	...	12	3	...	...
Durham.....	W.	4,479	6,679	2.7	5.4	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	12	3	1	...
Dr. Z. T. Brooks.	C.	2,200		19.0		...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	2	...	...	...
Goldsboro.....	W.	3,377		7.1		...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	2	8	4	1
J. E. Peterson, Mayor.	C.	2,500	5,877	28.4	16.3	...	...	...	...	...	...	...	2	...	...	...	3	...	...	...	6	...	...	...
Henderson.....	W.	2,046		11.7		...	...	...	...	...	...	1	1	...	...	...	...	1	...	...	2	4	2	...
Dr. F. R. Harris.	C.	1,700	3,746	14.1	12.8	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	2	...	...	...
Laurinburg.....	W.	834		14.4		...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	2	1	...
Dr. A. W. Hamer.	C.	500	1,334	24.0	18.0	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...
Lenoir.....	W.	1,036		0.0		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	0	...	...
Dr. A. A. Kent.	C.	260	1,296	0.0	0.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	0	...	...
Marion.....	W.	766		0.0		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	0	...	...
Dr. B. A. Cheek.	C.	350	1,116	0.0	0.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	0	...	...
Monroe.....	W.	1,827		6.6		...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	1	...	...
Dr. J. M. Blair.	C.	600	2,427	0.0	4.9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	0	...	...
Oxford.....	W.	1,159		0.0		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	1	...	...
Dr. S. D. Booth.	C.	900	2,059	13.3	5.8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	1	...	...
Raleigh.....	W.	8,643		15.2		...	...	...	...	...	...	2	...	2	1	...	1	5	...	...	11	15	5	...
T. P. Sale, Clerk B. H.	C.	5,000	13,643	9.6	13.2	...	...	...	...	...	...	1	2	...	...	...	...	1	...	...	4	...	1	1
Reidsville.....	W.	2,000		12.0		...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	2	4	2	...
J. T. Smith, Clerk.	C.	1,260	3,260	19.0	14.7	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	2	...	...	...
Rockingham.....	W.	1,007		59.6		...	...	...	...	...	...	1	...	1	...	...	1	2	...	...	5	5	4	...
Dr. J. M. Ledbetter.	C.	500	1,507	0.0	39.8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	...	...	...
Rocky Mount.....	W.	1,837		6.5		...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	3	...	...
Dr. G. L. Wimberley, Jr.	C.	1,100	2,937	21.8	12.3	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	2	...	...	...
Salem.....	W.	3,242		0.0		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	1	...	...
S. E. Butner, Mayor.	C.	400	3,642	30.0	3.3	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...
Salisbury.....	W.	4,277		5.6		...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	2	8	3	...
Dr. W. W. McKenzie.	C.	2,000	6,277	36.0	15.3	...	...	...	...	...	...	2	...	...	...	...	3	1	...	...	6	...	1	...
Scotland Neck.....	W.	1,000		12.0		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	1	...	...
Dr. J. P. Wimberly.	C.	500	1,500	0.0	8.0	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	0	...	...	...
Smithfield.....	W.	500		0.0		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	1	...	...
J. C. Bingham, Mayor.	C.	264	764	45.7	15.8	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	0	...	...	...
Tarboro.....	W.	2,000		6.0		...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	1	...	...
Dr. L. L. Staton.	C.	500	2,500	0.0	4.8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	...	...	...
Warrenton.....	W.	536		44.7		...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	2	2	...	...
Dr. P. J. Macon.	C.	300	836	0.0	28.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	...	...	...
Washington.....	W.	2,842		12.6		...	...	...	...	...	...	...	2	...	...	...	...	1	...	...	3	7	...	...
Dr. Jno. G. Blount.	C.	2,000	4,842	24.0	17.3	...	...	...	...	...	...	1	1	1	...	...	...	1	...	...	4	...	1	...
Weldon.....	W.	700		0.0		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	1	...	...
J. T. Gooch, Mayor.	C.	733	1,433	16.4	8.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Wilmington.....	W.	9,976		12.0		...	...	...	...	...	...	1	3	...	...	...	5	...	...	...	10	36	1	...
Dr. Chas. T. Harper.	C.	11,000	20,976	28.4	20.6	...	...	...	...	...	...	4	...	2	3	15	1	...	...	...	26	...	9	4
Wilson.....	W.	1,825		13.2		...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	2	7	3	...
Dr. W. S. Anderson.	C.	1,700	3,525	35.3	23.8	...	...	...	...	...	...	1	...	1	...	...	3	...	...	...	5	...	...	...

N. B.—The reporters for the cities and towns printed in **Black Type** have signed this certificate: "I hereby certify that this report gives the *whole* number of deaths occurring within the corporate limits during the above month." The total populations are taken from the census report for 1900, but the division into races is estimated, as those figures have not been given out.

County Superintendents of Health.

Alamance.....	Dr. T. S. Faucette.	Jones.....	Dr. S. E. Koonce.
Alexander.....	Dr. T. F. Stevenson.	Lenoir.....	Dr. W. T. Parrott.
Alleghany.....	Dr. B. C. Waddell.	Lincoln.....	Dr. T. F. Costner.
Anson.....	Dr. E. S. Ashe.	McDowell.....	Dr. B. A. Cheek.
Ashe.....	Dr. Manley Blevins.	Macon.....	Dr. F. L. Siler.
Beaufort.....	Dr. P. A. Nicholson.	Madison.....	Dr. Jas. K. Hardwicke.
Bertie.....	Dr. H. V. Dunstan.	Martin.....	Dr. W. H. Harrell.
Bladen.....	Dr. Newton Robinson.	Mecklenburg.....	Dr. F. M. Winchester.
Brunswick.....	Dr. J. A. McNeill.	Mitchell.....	Dr. V. R. Butt.
Buncombe.....	Dr. James Sawyer.	Montgomery.....	Dr. M. P. Blair.
Burke.....	Dr. J. L. Laxton.	Moore.....	Dr. Gilbert McLeod.
Cabarrus.....	Dr. D. G. Caldwell.	Nash.....	Dr. J. P. Battle.
Caldwell.....	Dr. A. A. Kent.	New Hanover.....	Dr. W. D. McMillan.
Camden.....		Northampton.....	Dr. H. W. Lewis.
Carteret.....	Dr. F. M. Clark.	Onslow.....	Dr. E. L. Cox.
Caswell.....	Dr. S. A. Malloy.	Orange.....	Dr. C. D. Jones.
Catawba.....	Dr. Geo. H. West.	Pamlico.....	
Chatham.....	Dr. H. T. Chapin.	Pasquotank.....	Dr. H. T. Ayddlett.
Cherokee.....	Dr. J. F. Abernathy.	Pender.....	Dr. L. L. Ardrey.
Chowan.....	Dr. T. J. Hoskins.	Perquimans.....	Dr. C. C. Winslow.
Clay.....	Dr. J. M. Sullivan.	Person.....	Dr. J. A. Wise.
Cleveland.....	Dr. B. H. Palmer.	Pitt.....	Dr. C. O'H. Laughing-
Columbus.....	Dr. I. Jackson.		house.
Craven.....	Dr. R. DuVal Jones.	Polk.....	Dr. Earle Grady.
Cumberland.....	Dr. J. Vance McGougan.	Randolph.....	Dr. T. T. Ferree.
Currituck.....	Dr. H. M. Shaw.	Richmond.....	Dr. J. M. Ledbetter.
Dare.....	Dr. W. B. Fearing.	Robeson.....	Dr. H. T. Pope.
Davidson.....	Dr. Joel Hill.	Rockingham.....	Dr. Sam Ellington.
Davie.....	Dr. James McGuire.	Rowan.....	Dr. W. L. Crump.
Duplin.....	Dr. James W. Blount.	Rutherford.....	Dr. W. A. Thompson.
Durham.....	Dr. Z. T. Brooks.	Sampson.....	Dr. R. E. Lee.
Edgecombe.....	Dr. L. L. Staton.	Scotland.....	Dr. A. W. Hamer.
Forsyth.....	Dr. John Bynum.	Stanly.....	Dr. V. A. Whitley.
Franklin.....	Dr. E. S. Foster.	Stokes.....	Dr. W. V. McCanless.
Gaston.....	Dr. J. H. Jenkins.	Surry.....	Dr. John R. Woltz.
Gates.....	Dr. W. O. P. Lee.	Swain.....	Dr. J. A. Cooper.
Graham.....	Dr. R. J. Orr.	Transylvania.....	Dr. C. W. Hunt.
Granville.....	Dr. S. D. Booth.	Tyrrell.....	
Greene.....	Dr. Joseph E. Grimsley.	Union.....	Dr. J. E. Ashcraft.
Guilford.....	Dr. Edmund Harrison.	Vance.....	Dr. Goode Cheatham.
Halifax.....	Dr. I. E. Green.	Wake.....	Dr. J. J. L. McCullers.
Harnett.....	Dr. O. L. Denning.	Warren.....	Dr. A. S. Pendleton.
Haywood.....	Dr. F. M. Davis.	Washington.....	Dr. W. H. Ward.
Henderson.....	Dr. J. G. Waldrop.	Watauga.....	Dr. E. F. Bingham.
Hertford.....	Dr. John W. Tayloe.	Wayne.....	Dr. Williams Spicer.
Hyde.....	Dr. E. H. Jones.	Wilkes.....	Dr. J. M. Turner.
Iredell.....	Dr. Henry F. Long.	Wilson.....	Dr. W. S. Anderson.
Jackson.....	Dr. Wm. Self.	Yadkin.....	Dr. S. L. Russell.
Johnston.....	Dr. L. D. Wharton.	Yancey.....	Dr. W. M. Austin.

[You are asked to fill out and mail one of these forms to the Superintendent of Health of your county on or before the third of each month, that he may use it in making his report to the Secretary of the State Board.]

Have any of the following diseases occurred in your practice during the month just closed. If so, state number of cases.

Whooping-cough ----- Typhoid Fever -----

Measles ----- Typhus Fever -----

Diphtheria ----- Yellow Fever -----

Scarlet Fever ----- Cholera -----

Pernicious Malarial Fever ----- Smallpox -----

Hemorrhagic Malarial Fever ----- Cerebro-spinal Meningitis -----

What have been the prevailing diseases in your practice?

Has any epidemic occurred among domestic animals? If so, what?

What is the sanitary condition of your section, public and private?

General Remarks: -----

----- M. D.

BULLETIN

OF THE

North Carolina Board of Health.

Published Monthly at the Office of the Secretary of the Board, Raleigh, N. C.

GEO. G. THOMAS, M. D., *Pres.*, Wilmington.
S. WESTRAY BATTLE, M. D....Asheville.
HENRY W. LEWIS, M. D.....Jackson.
J. L. NICHOLSON, M. D.....Richlands.

W. P. IVEY, M. D.....Lenoir.
FRANCIS DUFFY, M. D.....New Bern.
W. H. WHITEHEAD, M. D.....Rocky Mt.
J. L. LUDLOW, C. E.....Winston.

RICHARD H. LEWIS, M. D., *Secretary and Treasurer*, Raleigh.

VOL. XVI.

JUNE, 1901.

No. 3.

The Meeting of the Board.

The annual meeting of the Board occurred, as required by law, at the same time and place as that of the State Medical Society, May 21-22, at Durham. All the members were present. Doctors Thomas and Lewis were re-elected President and Secretary, respectively. The Secretary reported officially the favorable action of the State Board of Agriculture on the request to have bacteriological analyses of suspected drinking water made in their biological laboratory, and the following resolution was adopted:

WHEREAS, the State Board of Agriculture responded favorably to the request of the State Board of Health made at its last annual meeting to provide in its biological laboratory for the free bacteriological examination of drinking waters suspected of

conveying disease, especially typhoid fever; and

WHEREAS, the work of this kind already done shows even thus early its great value to the people, actual and prospective; now, therefore, be it

Resolved, That the State Board of Health desires to put on record its appreciation of this additional evidence of the progressive and enlightened spirit displayed by the State Board of Agriculture in its work and to express its belief that the expenditure for this purpose will be returned many fold to the people of the State in the saving of many valuable lives and great loss of time from long illnesses and in the education of the people as to the importance and value of sanitation.

In compliance with the act of the last Legislature creating a State Board of Embalmers, to be "appointed by the State Board of Health, three of whom shall be members of the State Board of Health, the remaining two shall be practical embalmers," etc., Messrs. J. W. Harry, of Char-

lotte, and H. W. Simpson, of New Bern, practical embalmers, were elected for five and four years, and Drs. Battle, Duffy and Lewis, R. H., for three, two and one years, respectively. This Board is to meet for organization on July second. A committee of three, composed of Henry W. Lewis, M. D., J. L. Ludlow, C. E., and the Secretary, was appointed to prepare a new edition of the "Instructions for Quarantine and Disinfection."

The Treasurer made his annual report and Drs. Ivey and Duffy were appointed a committee to audit the same. They reported it correct.

The Con-joint Session with the State Medical Society assembled, as usual, at 12 M., Wednesday. The Secretary read his report which is appended. Following this was quite an animated discussion upon the true character of a disease which had prevailed extensively in Wilson county, and about which there was a difference of opinion between the Superintendent of Health of the county on the one side and the State Small-pox Inspector and a member of the State Board of Health on the other—the first claiming it to be chicken-pox and the last two small-pox. Unfortunately neither of the last two gentlemen were present but the general sentiment was all against the chicken-pox theory. We hope it may have been chicken-pox and that nothing will be heard from it next winter, but we must say we feel very anxious about it.

The term of office of the four members elected by the Society having expired, Doctors S. Westray Battle, of Asheville, and Henry W. Lewis, of Jackson, were elected for the term of six years, to succeed themselves, and Doctors J. L. Nicholson, of Richlands, and W. H. Whitehead, of Rocky Mount, for the term of four years.

The following is the report of the Secretary:

ANNUAL REPORT OF THE SECRETARY.

The past year has been marked by greater progress in our efforts to protect the public health than any equal period in the history of the Board. Our work in trying to educate the public mind up to the importance and value of sanitation in its various forms is beginning to tell. The evidence of this is seen in the provision made by the Department of Agriculture for the free biological analyses of suspected drinking waters, in addition to the chemical analyses it has been making for years; in the valuable amendments to our health law made by the last Legislature—and made not grudgingly but in a liberal and enlightened spirit; in the enactment of a law regulating the embalming of dead bodies; in the increase in the number of public water supplies—eight, or thirty-three per cent. actually, and many more prospectively; and in the greater interest taken by the people generally in such matters.

The full report of the work of the Board in detail from our last meeting at Tarboro to January 1, 1901, will be found in the Eighth Biennial Report, a copy of which will be gladly mailed to any one desiring it, and to which those interested are referred.

WATER ANALYSES.

The value of a bacteriological examination in locating the cause of typhoid fever in contaminated or infected drinking water is now thoroughly established. There are probably from eight to ten thousand cases of typhoid fever in the State every year. In very many instances a number of cases following one another at longer or shorter intervals have their origin in a common infected well or spring. If the drinking water supply of the first case should be promptly examined bacteriologically, and the fact of its infection demonstrated, a number of the latter cases could be prevented.

Realizing this and desiring to bring it directly to the attention of the profession, together with the fact that the examination could be obtained free of charge, I mailed to every physician in the State the following letter, in addition to publishing essentially the same thing in *THE BULLETIN*, which they also received:

RALEIGH, N. C., January 20, 1901.

MY DEAR DOCTOR:—As you will have noticed in *THE BULLETIN* for December, mailed you the first of the month, the State Agricultural Department has made provision for the bacteriological examination of drinking waters suspected of carrying disease. Since the article in *THE BULLETIN* was written the Honorable Commissioner of Agriculture has ruled that all applications for such analysis must be made to the Secretary of the State Board of Health, and approved by him before the work will be done, for the purpose of guarding his laboratory against too numerous applications based on mere curiosity. As the county superintendent of health is the recognized health officer of every county, application should first be made to him, giving the reasons for suspecting the water, with request that he approve and forward to me, and upon receipt I will, if satisfied as to the necessity for the analysis, forward permit direct to you. In urgent cases, application may be made direct to me.

Whenever a case of undoubted typhoid fever occurs in a family, their drinking water should be analyzed bacteriologically as soon as possible. By promptly having this done, many cases of that disease would be prevented. So, if you have any cases of typhoid fever in your practice, send for permit, stating in your application the number of cases and the conditions.

Very truly yours,

RICHARD H. LEWIS,
Secretary.

My efforts in this direction have, I regret to say, borne but little fruit, only thirteen applications for analysis having been made by physicians in nearly four months. The indifference of the profession in this matter I find it difficult to explain, for while it is the duty of the physician to cure diseases, it is

none the less his duty to prevent it when he can—as all worthy of their calling will, of course, admit. If we do not avail ourselves of the privilege offered us it will, I fear, be withdrawn. Unless the value to the people of the State of this work can be demonstrated to the satisfaction of the Board of Agriculture it will surely be discontinued, and when it is too late we will realize what we have lost. I hope, therefore, every one who hears or reads this will make it an invariable rule in every case of typhoid fever, immediately upon making the diagnosis, to write me for a permit and a sterilized bottle. While, in the letter, in order to show proper respect for the office of county superintendent of health and perhaps protect the Department of Agriculture from occasional unnecessary work, I made it a condition of the issuance of the permit that the application, except in urgent cases, should first be made to that official, who would approve and transmit to me, I have since abandoned it as being cumbersome and promotive of delay. As a matter of fact all these cases are urgent cases, and a direct application to me will secure the permit and bottle at once.

LEGISLATION.

Realizing from our experience in the management of small-pox during the past three years that our law of 1893 was defective in a certain vagueness as to the duties and powers of county authorities in matters pertaining to the public health, I prepared and secured the passage by the General Assembly of the act amendatory thereto given below. This was done, I am glad to say, without difficulty, as was to have been expected of a body of men of such intelligence and character as those composing the recent Legislature. Although nearly all the members supported the bill, I feel that special acknowledgment should be made to Senators Justice and Henderson, of the Judiciary

Committee, for legal advice, and to Dr. Speight, of Edgecombe, in the Senate, and Dr. Stevenson, of Iredell, in the House, for valuable aid.

The following is the act:

AN ACT TO AMEND AN ACT RELATING TO
THE BOARD OF HEALTH, CHAPTER 214,
LAWS OF 1893.

The General Assembly of North Carolina do enact:

SECTION 1. That section 2 of chapter 214, Laws of 1893, be amended by striking out in line two the words "two years" and inserting in lieu thereof the following: "two for four years and two for six years and their successors for six years," and by striking out in line five the words "two years" and inserting in lieu thereof the following: "one for two years, two for four years and two for six years and their successors for six years."

SEC. 2. That section 4 be amended by striking out in lines three and four respectively the word "two" and inserting in lieu thereof the word "six."

SEC. 3. That section 5, as amended by chapter 201, Laws of 1897, be stricken out and the following substituted therefor:

"SECTION 5. There shall be an auxiliary board of health in each county in the State, whose function shall be, upon the call of the chairman of the board of county commissioners, to advise the county authorities in all matters pertaining to the public health. These boards shall be composed of all registered physicians resident in the county. From this board two physicians, shall be selected, one by the chairman of the board of county commissioners and one by the mayor of the county town, who, together with the board of county commissioners, shall constitute the county sanitary committee, of which committee the chairman of the board of county commissioners shall be *ex officio* chairman. Their term of office

shall be conterminous with that of the commissioners with whom they serve, and when on duty they shall receive the same compensation as is received by the county commissioners. The county sanitary committee shall have the immediate care and responsibility of the health interests of their county. They shall make such rules and regulations, pay such fees and salaries and impose such penalties as in their judgment may be necessary to protect and advance the public health. And any person violating such rules and regulations shall be guilty of a misdemeanor and may be fined not exceeding fifty dollars or imprisoned not exceeding thirty days. They shall elect a registered physician, not a member of the sanitary committee, to serve two years, with the title of county superintendent of health, and shall fix his compensation. The duty of the county superintendent of health shall be to carry out as far as possible such work as may be directed by the county sanitary committee and by the State Board of Health. He shall always promptly advise the Secretary of the State Board of Health of the unusual prevalence of disease in his county, especially of typhoid fever, scarlet fever, diphtheria, yellow fever, small-pox and cholera. He shall make the medico-legal post-mortem examinations for coroners' inquests, attend the inmates of the home for the aged and infirm and the prisoners in the jail or convict camp of his county, and make examinations of lunatics for commitment. He shall be the sanitary inspector of the home and jail, including convict camps, of his county, making monthly reports to the county commissioners and to the Secretary of the State Board of Health."

SEC. 4. That section 8 be stricken out and the following substituted therefor: "The meeting of the State Board of Health for the election of officers shall be on the

second day of the annual meeting of the Medical Society of the State of North Carolina in 1901, and every six years thereafter; and of the county sanitary committee for the election of a county superintendent of health on the first Monday in May, 1901, and every two years thereafter."

SEC. 5. That section 14 be amended by inserting after the word "commissioners" in line five the words "or county sanitary committee."

SEC. 6 That section 15 be amended by inserting between the words "town" and "near" at the end of line two the words "or the sanitary committee of a county"; by striking out after the word "town" in line fourteen the words "or county board of health" and inserting in lieu thereof the words "board of health or county sanitary committee;" and by striking out after the word "town" in line twenty-one the words "or county board of health" and inserting in lieu thereof the words "board of health or county sanitary committee."

SEC. 7. That section 23 be amended by striking out all of said section from the beginning of line ten and inserting in lieu thereof the following: "the sanitary committee of any county may make such regulations and provisions for the vaccination of its inhabitants and impose such penalties as they may deem necessary to protect the public health; and any person violating such regulations shall be guilty of a misdemeanor and may be fined not exceeding fifty dollars or imprisoned not exceeding thirty days."

SEC. 8. That section 25 be amended by adding thereto the following: "And any person violating such regulations shall be guilty of a misdemeanor and may be fined not exceeding fifty dollars or imprisoned not exceeding thirty days."

SEC. 9. That section 7 having been repealed the number of section 8 be changed to 7

and of all subsequent sections in accordance therewith.

SEC. 10. That this act shall be in force from and after its ratification.

It will be seen that, stated in a few words, to quote from the editorial comments thereon in THE BULLETIN for February, these amendments "consist essentially: In increasing the term of members of the State Board of Health from two years, all expiring at the same time, to six years, so arranged as to expire at different times, thereby assuring a continuing board; in the creation of a "county sanitary committee," composed of the board of county commissioners and two physicians and endowed with definite responsibilities and powers; and in restoring the term of office of county superintendent of health from one to two years. Our law has always been defective in not providing proper machinery for its administration by counties. That defect is now remedied as satisfactorily, we think, as the conditions obtaining in our State will permit. It will also be noted that the medical profession is recognized as far as practicable, and this we hope will revive their interest in sanitary matters. It is true that the control remains in the hands of the board of county commissioners, as they will always be in a majority, but in all matters pertaining to the public health, including the election of a county superintendent of health, two physicians will have a voice."

It also appears that the State Medical Society must at this meeting elect two members to serve for six years, and two for four years, with the following members appointed by His Excellency, Governor Aycock, viz.: Drs. W. P. Ivey and Richard H. Lewis for six years, Drs. George G. Thomas and Francis Duffy for four years, and Mr. J. L. Ludlow, C. E., for two years.

In order that there might be no miscarriage in the organization of the county sani-

tary committees, I addressed a letter on March 2d to every board of county commissioners calling their attention to the amended laws, at the same time mailing them a copy, and again on March 28th I wrote to the chairman of every board and to the mayor of every county town, reminding them of the duty imposed upon them of each appointing a physician to serve as a member of the county sanitary committee. Although I specially requested that I should be notified of the appointments and enclosed a postal card for reply, there are still a number of counties and towns to be heard from, and it is therefore impossible to say how many county sanitary committees have been properly organized.

The first fruits of this creation of practically a county board of health was shown in a request from the committee of Guilford county to your Secretary to visit Greensboro and advise with them as to the probable cause of much malarial fever just north of the city in recent years, and the best means of removing it; and in a similar request from the committee of the county of Durham to go to Durham and advise with them as to the best management of the small-pox which had gained a foot-hold in the county. I complied with both requests.

SMALL-POX.

The history of small-pox in the State during the past year is practically a repetition of that for the preceding two years, although the number of cases is nearly one thousand less, being 1,945 against 2,806 for the year 1899-1900, of whom 530 were white and 1,415 colored—a somewhat larger proportion of whites than heretofore. The death-rate has also been lower, 2.83 per cent. for the whites against 4.78 per cent., and

1.63 per cent. for the colored against 1.44 per cent; total 1.95 per cent. against 2.31 per cent. This decrease is probably due to the vaccination of a considerable proportion of the people through the influence of previous scares, for otherwise a reasonable expectation was that there would be more cases instead of fewer. This explanation is rendered more probable by the fact that this last year the disease has prevailed chiefly in the country districts where vaccination has not been practised as it has been in the cities and towns, centres of population and trade.

Some time since I received from a friend a copy of a poster illustrated with pictures of cases of small-pox, and containing the announcement, "vaccine sold here," which he had picked up in Tennessee, and which was accompanied by a letter suggesting that they might be made useful in this State. It revived a suggestion I made to the Board several years ago to placard the State with the simple rules of health, and immediately appealed to me, so I wrote the Mulford Company asking if they could furnish me with similar posters signed by the Board, and at what price. In response they kindly sent me several thousand in the form desired without charge. I have distributed them in a number of counties where small-pox was prevailing and they seem to have been of service. The man who would "rather have small-pox than be vaccinated" stops talking after seeing the pictures. The small-pox inspectors, whose reports are attached, have continued to be of much service, Governor Aycock having given his consent to their employment, as required by the section of the law making a special appropriation for use when rendered necessary by pestilential disease. In tabulated form the small-pox statement is as follows:

SMALL-POX IN NORTH CAROLINA, MAY 1, 1900, TO MAY 1, 1901.

COUNTIES.	NUMBER OF CASES.			NUMBER OF DEATHS.		
	White.	Col'd.	Total.	White.	Col'd.	Total.
Alamance		3	3			
Alexander		2	2			
Buncombe	13	22	35			
Burke	44	15	59			
Cabarrus	3	25	28		1	1
Caswell	56	110	166	5	1	6
Chatham	7	6	13			
Cherokee	1	1	2			
Cleveland	2	38	40		1	1
Craven	2	28	31	1	2	3
Cumberland	32	74	106			
Currituck		7	7		1	1
Davidson	8	50	58			
Davie	1	9	10			
Durham	12	90	102			
Edgecombe		17	17			
Forsyth	2	73	75		2	2
Franklin		50	50			
Gaston	40	8	48			
Gates		17	17			
Granville	26	8	34			
Greene	52	140	192			
Guilford	14	16	30			
Halifax	2	22	24			
Harnett	12	15	27			
Henderson	4	1	5			
Hertford		1	1			
Iredell	5		5			
Johnston	7	8	15			
Lenoir		1	1			
Lincoln	2		2			
Mecklenburg	30	88	118	1	2	3
Moore		18	18		1	1
Nash	16	58	74	2	2	4
New Hanover	1	8	9			
Orange	9	32	41			
Pamlico		30	30			
Pasquotank		10	10		2	2
Person	11	29	40		1	1
Pitt		7	7			
Polk	9		9			
Randolph	2	8	10			
Richmond		1	1			
Robeson		52	52		2	2
Rockingham					2	2
*Rutherford	35	108	143	1		1
Stanly	6	15	21			
Transylvania						
Vance	3	2	5			
Wake	10	71	81	1	1	2
Watauga	10		10			
Wayne		4	4			
Wilkes		17	17			
*Wilson						
Yancey	40		40	2		2
Total (in 54 counties)	530	1,415	1,945	15	23	36
Death-rate, per cent.				2.83	1.63	1.95

* Number of cases not reported, only deaths.

The county of Wilson has been omitted from the foregoing table for the reason that the figures could not be obtained from the County Superintendent of Health because, in his opinion, there has been no small-pox. In his reply to my letter asking for his report on small-pox for the year he writes:

"Our discussion to-day before our County Society was the eruptive disease that has prevailed in this county for the past three months, and it was the unanimous opinion that it is not small-pox. I suppose there have been 500 cases in the town and county and only one death, and that in an old man who was sick with la grippe nine days before he broke out."

On the other hand the small-pox inspector for that section of the State, who was sent to the county at the request of a member of the State Board of Health living there says the disease was small-pox and two of the leading physicians of the county in a letter to the inspector dated May 11, 1901, says: "We believe there has been small-pox in the county in the practice of other physicians, and we know there are cases of small-pox we have seen."

The above is a simple statement of the facts in the possession of the Secretary and the candid reader can draw his own conclusions, relying in doing so on the good character and sincerity of all the parties to the controversy.

In conclusion, it is safe to say that we are justified in feeling encouraged, and with the more active support from the profession at large still greater progress is in reach.

Review of Diseases for May, 1901.

NINETY-ONE COUNTIES REPORTING.

Ninety-four counties have Superintendents of Health.

Except in the case of the more contagious and dangerous diseases the Super-

intendent has, as a rule, to rely upon his own information alone, since few physicians can be induced to report cases of non-contagious diseases to him.

Where the number of cases is not given or the prevalence of a disease otherwise indicated, its mere presence in the county is to be understood as reported.

For the month of May the following diseases have been reported from the counties named:

MEASLES.—Alamance, 68 cases; Anson; Ashe, 10; Beaufort, 2; Bladen, a few; Brunswick, a great many; Cabarrus, 2; Caldwell, 20; Carteret; Chatham, 1; Columbus, a few; Cumberland, a few; Currituck, a few; Davidson, several; Graham, several; Granville, 3; Guilford, 3; Henderson, 22; Hyde, 4; Jackson, 25; Lincoln, 10; Macon, 3; Montgomery, 4; Moore, several; New Hanover, 21; Onslow, 20; Pasquotank, 2; Pender, a few; Perquimans, 40; Polk, 1; Randolph, a great many; Richmond, 20; Robeson, epidemic; Rowan, 30; Stanly; Stokes, 3; Swain, a few; Wake, 69; Watauga, 20; Yadkin, general; Yancey, many—41 counties.

WHOOPIING-COUGH.—Alamance, 47; Alexander, epidemic; Beaufort, 2; Cabarrus, 12; Caldwell, 10; Chatham, many; Chowan, many; Craven, 2; Cumberland, a few; Currituck, a few; Davidson, several; Durham, 20; Granville, 8; Henderson, general; Johnston, many; Lincoln, 12; Mecklenburg, 20; Montgomery, 3; Moore, several; New Hanover, 5; Pasquotank, 2; Pender, a few; Person, 8; Polk, 15; Randolph, general; Rockingham; Rutherford, a few; Scotland, 10; Stanly; Vance, epidemic; Wake, 27; Watauga, a few; Wayne, a few; Wilson, a few; Yadkin, general; Yancy, many—36 counties.

SCARLET FEVER.—Buncombe, 4; Davidson, 6; Greene, 3; Iredell, 1; Mecklenburg, 5 or 6; Rockingham, 2; Rowan, 1—7 counties.

DIPHTHERIA.—Cabarrus, 2; Cleveland, 1; Davie, 1; Granville, 20; Macon 1; Rockingham, 1; Wake, 1—7 counties.

TYPHOID FEVER.—Cabarrus, 2; Caldwell, 3; Chatham, 6; Chowan, 1; Clay, 2; Columbus, 2; Craven, 2; Durham, 2; Granville, 1; Harnett, a few; Iredell, 1; Jones, 2; McDowell, 4; Macon, 2; Madison, 1; Montgomery, 2; New Hanover, 2; Onslow, 4; Pasquotank, 4; Pender, 1; Perquimans, 2; Person, 1; Polk, 2; Randolph, 4; Robeson; Rockingham, a few; Rowan, 2; Ruth-erford, 1 or 2; Sampson, a few; Scotland, 4; Stanly, in all parts; Surry 2; Union, 10; Vance, several; Wake, 2—35 counties.

MALARIAL FEVER.—Brunswick; Caswell; Chowan; Cumberland; Currituck; Duplin; Greene; Guilford; Halifax; Hyde; Onslow; Orange; Pasquotank; Perquimans; Person; Warren—16 counties.

MALARIA FEVER, HEMORRHAGIC.—Chowan, 1; Perquimans, 1.

MALARIAL FEVER, PERNICIOUS.—Hyde.

DIARRHOEAL DISEASES, INCLUDING DYSENTERY.—Alexander, general; Alleghany; Anson, general; Ashe; Bertie; Burke; Caldwell; Catawba; Cleveland; Columbus; Craven; Duplin; Franklin; Gaston; Granville; Greene, general; Halifax; Harnett; Haywood; Henderson; Hertford; Iredell, general; Lenoir; Lincoln, general; McDowell; Macon; Martin, general; Moore, general; New Hanover, general; Northampton, general; Onslow, general; Pasquotank; Pender, general; Perquimans; Person; Polk; Randolph; Richmond; Robeson, general; Rockingham; Scotland; Stanly, general; Stokes; Surry, general; Swain; Transylvania; Union, general, Wake; Watauga, general; Wayne—50 counties.

INFLUENZA.—Craven, mild, in all parts.

PNEUMONIA.—Anson; Clay; Haywood; Warren.

VARICELLA.—Caswell.

SMALL-POX.—Buncombe, 17; Cabarrus, 7; Caswell, 12; Chatham, 4; Cleveland, 8;

Cumberland, 20; Durham, 10; Gaston, 6; Greene, 2; Guilford, 4; Johnston, 19; Mecklenburg, 15; Orange, 10; Person, 29; Polk, 2; Robeson, 2; Rockingham, 2; Rowan, 2; Stanly, 2; Wake, 12; Wayne, several—20 counties.

BLACK-LEG IN CALVES.—Ashe.

CHOLERA IN CHICKENS.—Scotland.

CHOLERA IN HOGS.—Ashe; Bertie; Hyde; Robeson.

DISTEMPER IN HORSES.—Alexander; Burke; Graham; Yancy.

No disease reported from Dare, Edgecombe, Forsyth, Gates, Mitchell, Nash and Washington.

No reports received from Cherokee, Pitt and Wilkes.

Summary of Mortuary Reports for May, 1901.

(TWENTY-FOUR TOWNS).

Only those towns from which certified reports are received are included.

Aggregate popula- tion.....	White.	Col'd.	Total.
Aggregate deaths...	72,928	45,752	118,680
Representing tem- porary annual death rate per 1,000	103	99	202
	16.9	26.0	20.4

Causes of Death.

Typhoid Fever.....	1	0	1
Malarial fever	1	6	7
Whooping-cough ..	3	1	4
Measles	1	0	1
Pneumonia.....	10	12	22
Consumption	7	5	12
Brain diseases.....	8	0	8
Heart diseases.....	8	9	17
Neurotic diseases...	1	4	5
Diarrhoeal diseases	17	12	29
All other diseases..	44	47	91
Accident	1	2	3
Violence	1	1	2
	103	99	202
Deaths under five years.....	36	35	71
Still-born.....	12	8	20

Mortuary Report for May, 1901.

TOWNS AND REPORTERS.	RACES.	POPULATION.		TEMPORARY ANNUAL DEATH RATE PER 1,000.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrheal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	TOTAL DEATHS.		Deaths under five years.	Still-born.
		By Races.	Total.	By Races.	Total.																	By Races.	By Towns.		
Asheville	W.	9,694		14.9		...	...	...	...	...	...	1	...	...	...	...	1	4	1	...	...	12	6	4	...
Dr. C. V. Reynolds.	C.	5,000	14,694	14.4	14.7	...	...	...	...	...	...	1	1	2	3	...	1	1	...	...	...	18	18	3	...
Charlotte	W.	11,991		18.0		...	...	...	...	...	...	...	...	...	...	...	5	10	...	...	...	18	19	15	...
Dr. F. O. Hawley.	C.	6,100	18,091	37.7	24.5	...	...	1	...	2	...	2	1	...	...	...	13	...	...	...	...	37	7	...	...
Fayetteville	W.	2,770		8.7		...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	2	7	...	...
Dr. John D. McRae.	C.	1,900	4,670	31.8	18.0	...	...	...	...	...	...	1	...	1	...	...	2	...	...	...	...	5	7	...	...
Goldsboro	W.	3,377		17.8		...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	5	5	2	...
Geo. E. Hood, Mayor.	C.	2,500	5,877	9.8	14.3	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...	...	12	7	1	...
Henderson	W.	2,046		29.3		...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	...	5	10	...	...
Dr. F. R. Harris.	C.	1,700	3,746	35.3	32.0	...	...	...	...	...	...	1	...	...	...	1	...	3	...	...	...	5	2	...	...
Laurinburg	W.	834		0.0		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	1	...	...
Dr. A. W. Hamer.	C.	500	1,334	24.0	9.0	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	1	...	...
Lenoir	W.	1,036		11.6		...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	2	1	...
Dr. A. A. Kent.	C.	260	1,296	46.2	18.5	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...
Marion	W.	766		0.0		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	0	...	...
Dr. B. A. Cheek.	C.	350	1,116	0.0	0.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	0	...	...
Monroe	W.	1,827		13.1		...	...	...	...	...	...	1	...	...	...	...	1	...	...	...	...	2	2	...	...
Dr. J. M. Blair.	C.	600	2,427	0.0	9.9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	...	...	...
Oxford	W.	1,159		41.4		...	...	...	...	...	...	1	...	...	...	...	...	2	...	...	...	1	5	1	...
Dr. S. D. Booth.	C.	900	2,059	20.3	29.1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...
Raleigh	W.	8,643		13.8		...	...	...	...	...	...	...	...	2	3	...	3	6	...	...	...	15	28	4	3
T. P. Sale, Clerk B. H.	C.	5,000	13,643	31.2	24.6	...	...	...	...	1	...	1	2	...	...	...	1	9	...	...	...	13	4	2	...
Reidsville	W.	2,000		24.0		...	...	...	...	...	...	1	...	...	1	...	2	...	...	...	...	4	5	3	1
J. T. Smith, Clerk.	C.	1,260	3,260	9.5	18.4	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...
Rockingham	W.	1,007		47.6		...	...	...	...	...	...	...	1	1	...	...	2	...	...	...	...	4	5	...	...
Dr. Wm. P. Webb.	C.	500	1,507	24.0	39.8	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	1	...	...	...
Rocky Mount	W.	1,837		13.1		...	...	...	...	...	...	1	...	...	...	...	1	...	...	...	...	2	4	...	...
Dr. G. L. Wimberley, Jr.	C.	1,100	2,937	21.8	16.3	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	2	...	...	...
Salem	W.	3,242		18.5		...	...	...	...	...	...	1	...	...	...	...	3	...	...	...	...	5	7	1	...
S. E. Butler, Mayor.	C.	400	3,642	60.0	23.1	1	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	2	...	...	...
Scotland Neck	W.	1,000		24.0		...	...	...	...	...	...	1	...	...	...	...	1	...	...	...	...	2	2	...	...
Dr. J. P. Wimberly.	C.	500	1,500	0.0	16.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	...	...	...
Smithfield	W.	620		0.0		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	0	...	...
J. C. Bingham, Mayor.	C.	449	1,069	0.0	0.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	...	...	...
Southport	W.	900		0.0		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	1	...	...
Dr. D. I. Watson.	C.	500	1,400	24.0	8.6	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...
Tarboro	W.	2,000		6.0		...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	2	...	...
Dr. L. L. Staton.	C.	500	2,500	24.0	9.6	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...
Warrenton	W.	836		0.0		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	0	...	...
Dr. P. J. Macon.	C.	300	1,136	0.0	0.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	0	...	...
Washington	W.	2,842		0.0		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	0	...	...
Dr. Jno. G. Blount.	C.	2,000	4,842	0.0	0.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	0	...	...
Weldon	W.	700		0.0		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	...	...	...
J. T. Gooch, Mayor.	C.	733	1,433	32.7	16.7	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	...	2	2	1	...
Wilmington	W.	9,976		18.0		...	...	...	1	...	...	1	1	3	1	1	7	...	...	...	...	15	49	5	3
Dr. Chas. T. Harper.	C.	11,000	20,976	27.1	28.3	...	...	...	3	...	...	2	...	5	3	5	14	1	...	...	...	134	10	6	...
Wilson	W.	1,825		39.4		...	...	...	...	...	...	3	1	...	...	...	2	...	...	...	...	6	8	...	...
Dr. W. S. Anderson.	C.	1,700	3,525	14.1	27.2	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	2	...	...	...

N. B.—The reporters for the cities and towns printed in **Black Type** have signed this certificate: "I hereby certify that this report gives the *whole* number of deaths occurring within the corporate limits during the above month." The total populations are taken from the census report for 1900, but the division into races is estimated, as those figures have not been given out.

County Superintendents of Health.

Alamance	Dr. H. R. Moore.	Jones.....	Dr. S. E. Koonce.
Alexander	Dr. C. J. Carson.	Lenoir	Dr. Raymond Pollock.
Alleghany	Dr. B. C. Waddell.	Lincoln	Dr. T. F. Costner.
Anson	Dr. J. H. Bennett.	McDowell.....	Dr. B. A. Cheek.
Ashe.....	Dr. J. W. Calvard.	Macon	Dr. F. L. Siler.
Beaufort	Dr. Jno. G. Blount.	Madison	Dr. Jas. K. Hardwicke.
Bertie	Dr. H. V. Dunstan.	Martin.....	Dr. W. H. Harrell.
Bladen.....	Dr. Newton Robinson.	Mecklenburg.....	Dr. C. S. McLaughlin.
Brunswick	Dr. J. A. McNeill.	Mitchell.....	Dr. V. R. Butt.
Buncombe	Dr. James Sawyer.	Montgomery	Dr. M. P. Blair.
Burke.....	Dr. J. L. Laxton.	Moore.....	Dr. Gilbert McLeod.
Cabarrus.....	Dr. R. S. Young.	Nash	Dr. J. P. Battle.
Caldwell	Dr. A. A. Kent.	New Hanover	Dr. W. D. McMillan.
Camden.....		Northampton.....	Dr. H. W. Lewis.
Carteret	Dr. F. M. Clark.	Onslow.....	Dr. E. L. Cox.
Caswell	Dr. S. A. Malloy.	Orange.....	Dr. D. C. Parris.
Catawba	Dr. Geo. H. West.	Pamlico.....	
Chatham.....	Dr. H. T. Chapin.	Pasquotank	Dr. H. T. Aydlett.
Cherokee.....	Dr. J. F. Abernathy.	Pender.....	Dr. J. R. Thomson.
Chowan.....	Dr. T. J. Hoskins.	Perquimans	Dr. C. C. Winslow.
Clay.....	Dr. J. O. Nichols.	Person	Dr. J. A. Wise.
Cleveland	Dr. B. H. Palmer.	Pitt.....	Dr. C. O'H. Laughing-
Columbus.....	Dr. I. Jackson.		house.
Craven.....	Dr. W. H. Street.	Polk	Dr. Earle Grady.
Cumberland.....	Dr. Jno. D. McRae.	Randolph	Dr. S. Henley.
Currituck	Dr. H. M. Shaw.	Richmond.....	Dr. Wm. P. Webb.
Dare	Dr. W. B. Fearing.	Robeson	Dr. H. T. Pope.
Davidson	Dr. Joel Hill.	Rockingham	Dr. Sam Ellington.
Davie	Dr. James McGuire.	Rowan.....	Dr. W. L. Crump.
Duplin	Dr. O. F. Smith.	Rutherford.....	Dr. T. B. Twitty.
Durham	Dr. N. M. Johnson.	Sampson	Dr. R. E. Lee.
Edgecombe	Dr. L. L. Staton.	Scotland	Dr. A. W. Hamer.
Forsyth.....	Dr. John Bynum.	Stanly.....	Dr. V. A. Whitley.
Franklin	Dr. E. S. Foster.	Stokes	Dr. W. V. McCanless.
Gaston	Dr. J. H. Jenkins.	Surry	Dr. John R. Woltz.
Gates.....	Dr. W. O. P. Lee.	Swain.....	Dr. J. A. Cooper.
Graham	Dr. R. J. Orr.	Transylvania	Dr. C. W. Hunt.
Granville	Dr. S. D. Booth.	Tyrrell.....	
Greene.....	Dr. Joseph E. Grimsley.	Union	Dr. J. E. Ashcraft.
Guilford.....	Dr. Edmund Harrison.	Vance.....	Dr. Goode Cheatham.
Halifax	Dr. I. E. Green.	Wake.....	Dr. J. J. L. McCullers.
Harnett.....	Dr. O. L. Denning.	Warren.....	Dr. A. S. Pendleton.
Haywood	Dr. S. B. Metford.	Washington	Dr. W. H. Ward.
Henderson	Dr. J. G. Waldrop.	Watauga.....	Dr. T. C. Blackburn.
Hertford	Dr. John W. Tayloe.	Wayne.....	Dr. Williams Spicer.
Hyde.....	Dr. E. H. Jones.	Wilkes.....	Dr. J. M. Turner.
Iredell	Dr. Henry F. Long.	Wilson.....	Dr. W. S. Anderson.
Jackson.....	Dr. Wm. Self.	Yadkin	Dr. S. L. Russell.
Johnston	Dr. L. D. Wharion.	Yancey	Dr. W. M. Austin.

[You are asked to fill out and mail one of these forms to the Superintendent of Health of your county on or before the third of each month, that he may use it in making his report to the Secretary of the State Board.

Have any of the following diseases occurred in your practice during the month just closed. If so, state number of cases.

Whooping-cough ----- Typhoid Fever -----

Measles ----- Typhus Fever -----

Diphtheria ----- Yellow Fever -----

Scarlet Fever ----- Cholera -----

Pernicious Malarial Fever ----- Smallpox -----

Hemorrhagic Malarial Fever ----- Cerebro-spinal Meningitis -----

What have been the prevailing diseases in your practice?

Has any epidemic occurred among domestic animals? If so, what?

What is the sanitary condition of your section, public and private?

General Remarks:-----

----- M. D.

NOTICE TO PHYSICIANS.

The biological laboratory of the Department of Agriculture will re-open August 5. Application for bacteriological examination of drinking water suspected, with good reason, of causing typhoid fever or epidemic dysentery, may be made by any physician directly to the Secretary of the State Board of Health, who must approve application.

The articles in this number bearing on typhoid fever are commended to your attention.

BULLETIN

OF THE

North Carolina Board of Health.

Published Monthly at the Office of the Secretary of the Board, Raleigh, N. C.

GEO. G. THOMAS, M. D., *Pres.*, Wilmington.

S. WESTRAY BATTLE, M. D....Asheville.

HENRY W. LEWIS, M. D.....Jackson.

J. L. NICHOLSON, M. D.....Richlands.

W. P. IVEY, M. D.....Lenoir.

FRANCIS DUFFY, M. D.....New Bern.

W. H. WHITEHEAD, M. D.....Rocky Mt.

J. L. LUDLOW, C. E.....Winston.

RICHARD H. LEWIS, M. D., *Secretary and Treasurer*, Raleigh.

VOL. XVI.

JULY, 1901.

No. 4.

The Bacteriology of Typhoid Fever.

BY GERALD MCCARTHY, M. Sc., BIOLOGIST
N. C. DEPARTMENT AGRICULTURE.

Typhoid fever is a specific or germ disease due to a distinct and definite microbe, *Bacillus typhosus*, which has its biotic center in or about the intestines, but acting secondarily upon other organs of the body. During the progress of the disease and for some time after convalescence this microbe—more commonly known to physicians as the Klebs-Eberth bacillus—is invariably found in the intestines and discharges therefrom. It is also during convalescence generally found

in the bladder, urinary passages and urine. In the urinary passages it is the chief or sole cause of the cystitis and abscesses which often follow typhoid.

There also exists in the intestines of healthy persons and in most vertebrate animals a microbe specifically called *Bacillus coli communis* or colon bacillus. By no microscopic examination nor by any morphological test can we distinguish these two microbes from each other. It is only by biological tests—the growth of the two microbes on various artificial culture media—that we are able to distinguish one from the other. The differences at best seem to be of de-

gree rather than kind. This fact has led many bacteriologists to claim the specific identity of the typhoid and the colon microbes. These men hold that under circumstances unknown to us the common, nonpathogenic colon bacillus may be transmuted into the deadly typhoid bacillus. Most systematic or botanical bacteriologists claim provisionally that the typhoid and colon microbes, along with those producing hog cholera, swine plague and yellow fever, are all varieties of one species, of which the original type is either lost or not yet discovered.

But for practical purposes we must assume that the colon and typhoid microbes are distinct species. The colon bacillus is common to men and most animals. The typhoid bacillus is never found in the animal body unless it has been purposely introduced there by human contrivance. Animals cannot contract typhoid fever!

Typhoid is endemic in North America and is the filth disease *par excellence* of this continent. How the bacillus is spread and the disease engendered has been copiously illustrated in a recent report of the Medical Board appointed to enquire into the cause of the typhoid epidemics which scourged the American camps during the late Spanish war.

In all of the camps the general tendency of the regimental surgeons—who were in almost every case recently taken from civil practice—was to diagnose typhoid as malaria or “typho-malaria.” The Medical Board found by blood examination and Widal tests that malaria was a very rare disease in all of the camps except those in Florida, and that “typho-malaria” was in nearly every case plain typhoid.

The report quoted shows by abundant

statistics that wherever 1,000 men are brought together from diverse localities at least three of them will bring in their system the typhoid bacillus. Given these three centers of infection and the crowded, careless, filthy life inevitable among raw recruits in camp, the spread of the disease is inevitable and is sure to figure on the hospital lists within eight weeks after assembling the men.

It is unnecessary therefore to speculate upon the possible derivation of the typhoid from the colon microbe. It must also be borne in mind that since animals do not harbor the typhoid germ a dead animal on the water shed or source of supply cannot cause typhoid fever. For a similar reason dysentery, gastric catarrh or other specific disease has no causal relationship with typhoid! The one sole and sufficient cause is the typhoid microbe present in the bowel of a non-immune person.

There is a belief among physicians that there is some real connection between malaria and typhoid. The writer has endeavored to show in a paper published in this BULLETIN—see BULLETIN NORTH CAROLINA BOARD OF HEALTH, July, 1900—that malaria is a specific disease requiring the agency of certain species of mosquito as a carrier. The so-called malaria supposed to be caused by excavating sewers, etc., during hot weather cannot in the light of present knowledge be the disease properly called malaria and due to the presence in the blood stream of the protozoan parasite *Hexameta vivax*. That parasite does not exist in the soil! On the other hand the soil of streets is apt to be polluted by the typhoid microbe and the turning up of the soil during the hot dusty season is liable to cause infection. It is a great pity that physicians do not more frequently

have recourse to the Widal test and blood examination in diagnosing malaria and typhoid.

The incubation period of typhoid microbe, or in other words the time which must elapse between the intrusion of the microbe into the human alimentary tract and the appearance of recognizable symptoms of the disease, is about $10\frac{1}{2}$ days. But the microbe begins to multiply within half hour after reaching the bowel. The bowel discharges contain the microbes in vast numbers within 24 hours after the original germ gained access. Therefore a person may for nine days continue to scatter virulent typhoid germs in his bowel discharges before the disease can be diagnosed. This fact accounts for many of the seemingly mysterious outbreaks of typhoid! After convalescence the patient continues to give off the germ, especially with the urine, for a period of several weeks. In case of cystitis or abscess following typhoid the germs may continue to be given off for a year or as long as the *sequela* last!

Probably nine out of ten cases of typhoid is contracted by drinking water containing the typhoid germ. In ordinary potable water the life of the typhoid germ is short. Usually 30 days is the limit. The longest period definitely established is 90 days. In polluted soil however the microbe may continue to exist and retain its virulence for more than two years.

Bed sheets soiled by excrements of a typhoid patient can usually be disinfected by two hours exposure to strong direct sunshine. Heavy blankets require a longer period. If such soiled bedding, especially if it is moist, be rolled up and cast into a dark or obscurely lighted closet the microbes may

continue to live for as long as five or six weeks. When earth containing this microbe is dug up and dried into dust the dust with living germs may be blown to a distance of one-eighth mile. The more common way of transferring infected earth is, however, upon the feet of persons and very likely on the feet of sparrows and other birds which convey the infection to the roofs of houses and thence into cisterns or water barrels.

Probably a prime agency for spreading typhoid is the common house fly. Excrements of typhoid infected persons is commonly thrown into privies without being previously disinfected. No attempt is made to cover this material. Flies gather upon it and subsequently entering houses deposit the germs adhering to their bodies upon food or drink or vessels used for such purposes. In this manner the germs eventually find their way into the alimentary tract of non-immune persons, who in due time develop typhoid fever. The carelessness of the nurse and attendants in handling food or food vessels with imperfectly sterilized hands is another important factor in spreading the disease.

When a physician diagnoses a case of typhoid the first precaution should be to have made up an abundant supply of an antiseptic solution. The best antiseptic is carbolic acid. The best strength to use in the sick-room is 3 per cent. To make up such a solution take four ounces of carbolic acid and dissolve in one gallon of clean soft water. Use this solution freely for washing the hands, buttocks and other soiled parts. Rinse bed-pans and chamber vessels with this solution and cover all evacuations and let stand for 10 minutes before casting into sink or privy. Soak soiled linen and bedding in boiling water for 10

minutes and dry before casting into the laundry basket. After the patient is convalescent order the sick room to be scrubbed with boiling hot water and then use the above disinfectant. It is not necessary to burn bedding or carpeting. Expose these freely to the sun for several days. One may with impunity sleep in a bed infected by virulent typhoid germs so long as these germs do not find their way into the mouth. There is no other gate-way for this microbe!

After the patient is convalescent he should be carefully instructed to cover his evacuations with dry earth or air-slaked lime. This must be done so thoroughly that flies cannot get at the infectious material.

Every sanitarian and thoughtful physician should discourage the use of dug wells. This type of well is now obsolete. The digging of wells in incorporated cities and towns should be prohibited as a menace to public health. Driven or drilled wells, not less than one hundred feet deep, with metallic casing, is the only trustworthy and hygienic source of a supply of ground-water for drinking purposes.

In cities and towns having a public water supply the use of shallow or dug wells should be abandoned at once and *in toto*. It is a comparatively easy matter to watch a public water supply, but it is practically impossible to properly guard a multitude of private wells.

The writer is not tooting for water companies, but it is only fair to state that all such supplies so far tested in the biological laboratory of the North Carolina Department of Agriculture showed unexceptional water. The reverse is true of the majority of well waters examined. Many of these well

waters were scarcely diluted sewage. Especially was this the case with waters from the eastern part of the State, where the soil is light and the permanent water level within a few feet of the surface. A pure and trustworthy water supply is the first essential for good health. It is the last thing upon which people should economize.

Some Brief Extracts from an Abstract of Report on the Origin and Spread of Typhoid Fever in U. S. Military Camps During the Spanish War of 1898.

We have recently received from the Surgeon-General of the Army a copy of the publication named above, and a most interesting and valuable document it is. Emanating from men of such high standing in the profession, particularly in this special line of investigation, as composed the *personnel* of the commission, viz.: Surgeons Walter Reed, U. S. A., Victor C. Vaughn, U. S. V., and E. O. Shakespeare, U. S. V., it could not be otherwise than valuable. We regret that our want of space must limit our quotations from Chapter xiv, GENERAL STATEMENTS AND CONCLUSIONS, given under fifty-seven heads, to a very few of general interest and importance to the civil practitioner. We omit the tabulated statements and give only the summary of them. The following are the extracts:

(8) *The miasmatic theory of the origin of typhoid fever is not supported by our investigations.*

There are still a few who believe that typhoid fever is due to a poison or miasm given off from the earth in gaseous form. We would not mention this obsolete theory were it not for the fact that while inspecting the camps we found intelligent

medical officers who believe that some intangible local condition inherent in the place was an important factor in the production of the epidemic. There is apparent in man a tendency to believe in the evil genius of locality. He is prone to attribute many of his misfortunes to indefinable conditions surrounding the place in which he has suffered. As we have stated, no fact in our investigations has been brought out more prominently than the demonstration that locality was not responsible for the epidemic. The Fifteenth Minnesota first developed typhoid fever at the fair grounds at St. Paul. There is certainly no evidence that there is any evil climatic influence connected with this place. It carried the epidemic with it to Fort Snelling, which has long had the reputation of being one of the most healthful army posts in the United States. From Fort Snelling the Fifteenth Minnesota was transferred to the open fields of Camp Meade, where generations of Pennsylvania farmers have passed the average number of years allotted to man without suspecting that their country was an unhealthy one. However, typhoid fever continued with the command from Minnesota because the men carried the germs of the disease in their bodies, clothing, bedding and tentage. Certainly any rational being would prefer any of the above mentioned localities to Port Tampa as a place of summer residence, and yet there was not a regiment in the Fourth Army Corps, encamped for so long a time in Florida, that had as many cases of typhoid fever as did the Fifteenth Minnesota.

(9) *The pythogenic theory of the origin of typhoid fever is not supported by our investigations.*

Murchison proposed this theory of the

origin of typhoid fever. This author states the theory in the following words:

Typhoid fever may be generated independently of a previous case by fermentation of fecal, and perhaps other forms of organic matter.

Translated into the terms of modern medicine, this theory is founded upon the belief that the colon germ may undergo a ripening process by means of which its virulence is so increased and altered that it may be converted into the typhoid bacillus, or at least may become the active agent in the causation of typhoid fever. Many French, English and American army medical officers believe that typhoid fever may originate in this way. Rodet and Roux, of the French army, have stated their belief that outside of the body the colon bacillus acquires "typhogenic" properties. Surgeon-Captain Davies, assistant professor of hygiene in the English Army Medical School, has expressed his belief in this theory. Some of the medical officers in the American army have also given it their adherence. Surgeon Davies gives the following statement of the reasons for his belief in this theory:

It is well known that "camp diarrhea" is of the commonest occurrence among troops shortly after taking the field in a tropical or subtropical climate. Change of habits, change of food, improper or unsuitable food, bad water, heat, and exposure to sun and chill—these are all obvious factors in its causation; there is nothing in any way specific. Let us consider the sequel as regards the individual and as regards his surroundings. The individual may in some cases remain in fairly good health and vigor, in spite of a continuance of the bowel trouble; other individuals may suffer more from the exposure, fatigue and weakening effects of the continued flux. The surroundings may possibly be and remain sanitary, the camp clean, the water pure; but in all probability the reverse will be the case—at any rate, in some instances

—the water bad, the soil fouled, very likely overcrowding of the camp, with consequent difficulty, if not impossibility, of proper removal or disposal of fecal matters. Under certain conditions of heat and moisture favorable to the development and multiplication of the low forms of vegetable and animal life which is the more likely or reasonable to expect, that diarrhea in weakly and exhausted individuals should remain diarrhea and nothing more, or that with an increase of filth and decomposition, polluting soil, air, and water, a development of filth-generated, pythogenic poison should take place, capable of causing in such weakly persons a fever, with diarrhea, a poison of the organism, producing pyrexia and inflammation of certain glands in the alimentary tract—in fact, a specific fever? Is this supposition of the evolution, gradual or rapid according to circumstances, of a disease poison, dependent on increasing conditions of pollution of soil, air, or water, either separately or all three together, unreasonable or illogical? Would it not, on the contrary, be more unreasonable to suppose that, under such conditions, there should be no evolution at all? These conditions of camp pollution undoubtedly exist and tend to increase in many instances. Are they to have no effect? Is diarrhea to continue as simple diarrhea, or is evolution to come into action and produce a new disease? Now, indeed, only because the causes necessary for its production are just now brought into action—spontaneously only in the sense that water is of spontaneous origin, when from hydrogen and oxygen the electric spark has produced water where no water was before.

We believe that the results of our investigations controvert this theory conclusively. In the first place, we have been able to show that the specific poison of typhoid fever was introduced into every one of our national encampments, and with the disease as widespread as it is in this country, we believe that we have good reasons for the claim that one or more men already specifically infected with typhoid fever enlisted in nearly every command.

There is, therefore, no necessity of resorting to the theory that the colon bacillus may be converted into the typhoid bacillus. Moreover, all the known facts of experimental bacteriology are at variance with this theory. The supposition that simple diarrheas may develop into typhoid fever will be again referred to.

(10) *Our investigations confirm the doctrine of the specific origin of typhoid fever.*

As has already been stated, we have been able to trace the introduction of typhoid fever into every one of our national encampments and into the majority of the regiments. In case of the few commands about which there is some uncertainty as to the men bringing the typhoid infection from their homes, we may state that in all of these there was ample opportunity for the introduction of the specific poison from other commands.

(12) *Typhoid fever is disseminated by the transference of the excretions of an infected individual to the alimentary canals of others.*

It is more than probable that many individuals may for a while carry and eliminate the specific bacillus of typhoid fever without developing the disease themselves. Later we will make statements concerning the probable proportion of men who are immune to this disease. In discussing the etiology of typhoid fever we have seen that persons who have recovered from this disease may for a long time continue to carry and excrete the specific poison. We have also shown that the longevity of the Eberth bacillus outside of the body under certain conditions is much greater than is generally supposed. The agents by which the specific germ of typhoid

fever may be disseminated have been enumerated and quite fully discussed in the chapter on etiology.

(28) *Flies undoubtedly served as carriers of the infection.*

Flies swarmed over infected fecal matter in the pits and then visited and fed upon the food prepared for the soldiers at the mess tents. In some instances where lime had recently been sprinkled over the contents of the pit, flies with their feet whitened with lime were seen walking over the food.

It is possible for the fly to carry the typhoid bacillus in two ways. In the first place, fecal matter containing the typhoid germ may adhere to the fly and be mechanically transported. In the second place, it is possible that the typhoid bacillus may be carried in the digestive organs of the fly and be deposited with its excrement.

(29) *It is more than likely that men transported infected material on their persons or in their clothing and thus disseminated the disease.*

We have condemned the method which was followed in many of the camps of detailing men from the ranks to act as orderlies at the hospitals. In some of the commands it was customary to detail 100 or more men from the line every morning. These men went to the hospitals, handled bed pans used by persons sick with typhoid fever, and at night returned to their comrades. The most of these men were wholly ignorant of the nature of infection and the methods of disinfection. In fact, at one of the division hospitals we saw orderlies of this kind go from the hospital and partake of their midday meal without even washing their hands. These men handled not only the food which they

ate, but passed articles to their neighbors. It seems to us that a more certain method for the dissemination of an infectious disease could hardly have been invented.

We have stated that in some of the camps the surface, especially where there were strips of wood, was frequently dotted with fecal deposits. At the time of our inspection of the Third U. S. Volunteer Cavalry at Chickamauga it was quite impossible to walk through the woods near the camp without soiling one's feet with fecal matter. Much of this was probably specifically infected, and it is by no means improbable that the infection was carried by the men into their tents, where blankets and tentage became infected.

(31) *It is probable that the infection was disseminated to some extent through the air in the form of dust.*

The shell roads through the encampment at Jacksonville were ground into the finest dust by the heavy army wagons. The scavenger carts carrying the tubs filled with fecal matter passed along these roads and their course could often be traced by bits of feces falling from the tubs. Other vehicles ground up the fecal matter and dust together and the winds disseminated these particles here and there. Men inhaled this dust. It was deposited on food in the mess tents by the roadside, and men ate the dust. Pollution of the soil with the urine of those suffering with typhoid fever was of frequent occurrence. Cases of this disease under the diagnosis of malarial fever were repeatedly treated by the regimental surgeon throughout the entire sickness. Patients still convalescing were also returned to their respective companies. Under these conditions

there must have been abundant opportunity for contamination of the camp site with the specific germ. We are therefore inclined to the opinion that infected dust was one of the factors in the dissemination of typhoid fever.

(41) *Malaria was not a prevalent disease among the troops that remained in the United States.*

We have shown in the body of this report that blood examination for the plasmodium of malaria made by competent men at Camp Alger, Chickamauga, Knoxville, Camp Meade and Jacksonville show that malaria was a very rare disease among the troops that remained in the United States. This disease was undoubtedly more common in some of the camps than the blood examinations would indicate, because these were made for the most part on hospital patients and not upon those who merely reported to the regimental surgeon, were given quinine and returned to duty in a day or two. The malaria that did exist in the national encampments in this country yielded readily to quinine, and the cases that did not yield to this treatment were not malarial. It is unfortunate for scientific medicine that a competent man, properly equipped for making blood examinations, was not stationed at each division hospital at the time of its organization. Certainly we have a right to expect that the Government will use the best and most scientific methods in its army medical service. Had this been done scientific medicine would have been enriched by contributions of the greatest value. Is it too much to ask that a division hospital be furnished with facilities for scientific diagnosis equivalent to those possessed by all first-class hospitals?

(42) *The continued fever that prevailed*

among the soldiers in this country in 1898 was typhoid fever.

There is no evidence that any other continued fever was found among the troops that remained in the United States. We have mentioned the claim of one surgeon that dengue prevailed in his regiment at Chickamauga. We think it quite impossible for dengue to have prevailed in one regiment while all other troops of two army corps encamped at the same place escaped this disease. It was claimed by some that the continued fever prevalent at Chickamauga differed from typhoid fever, and that it was a disease peculiar to the place, and it was designated as "Chickamauga fever." That the continued fever prevalent in our camps in 1898 was typhoid fever is demonstrated by the following facts:

(a) When the temperature curve was not vitiated by the use of antipyretics it was that of typical typhoid fever.

(b) The fever was not broken or arrested by the administration of quinine.

(c) The death rate was that of typhoid fever.

(d) Whenever a post-mortem examination was made, and the total of these examinations was considerable, the characteristic lesions of typhoid fever were found.

(43) *In addition to the recognized cases of typhoid fever, there were many short and abortive attacks of this disease which were generally diagnosed as some form of malarial fever.*

While entertaining the opinion that many of the short febrile attacks were due to errors in diet, as our own investigations proceeded we strongly inclined to the belief that a considerable proportion of these fevers of short duration were due to infection with the typhoid

bacillus, and hence were to be considered as cases of mild or abortive typhoid fever. In other parts of this report we have called attention to the coincident rise and fall of these supposed malarial fevers with the occurrence of recognized typhoid fever in certain companies and regiments. Our studies have shown that those soldiers who had recovered from these supposed malarial fevers of short duration afterwards possessed a relatively marked immunity against typhoid fever, as compared with those who had not suffered with these milder fevers. The following table will give the result of our investigation bearing on this point in forty-eight regiments of the Second and Seventh Army Corps:

Table showing, for forty-eight regiments of the Second and Seventh Army Corps, the cases of typhoid fever among men with or without preceding malarial diseases.

Camp.	Num-ber of regi-ments.	Mean Strength.	Cases of malar-ia.	Typhoid fever with preceding malar-ia.		Men in regi-ments not having had malar-ia.	Typhoid fever without preced-ing malar-ia.		Total cases of ty-phoid fever.
				Num-ber of cases.	In 100 malar-ial cases.		Num-ber of cases.	In 100 individ-uals who had no malar-ia.	
Alger	19	21,988	4,083	63	1.5	17,965	1,888	10.5	1,951
Jacksonville	7	7,990	2,366	46	1.9	5,624	1,246	22.1	1,292
Meade	13	15,092	1,430	72	5.0	13,662	2,305	16.9	2,377
Jacksonville	9	10,759	1,676	81	4.8	9,983	2,014	22.5	2,125
Total	48	55,829	9,555	262	2.7	46,274	7,483	16.1	7,745

Thus, in a mean strength of 55,829 men, there were 9,555 who had experienced attacks of fever, which was generally designated as some form of malarial disease, most frequently as malarial remittent fever. Of this number only 262, or 2.7 per cent., suffered from subsequent attacks of typhoid fever. On the other hand, of 46,274 men who did not experience any attack of supposed malarial fever, 7,483, or 16.1 per cent., contracted typhoid fever.

(47) *While our examinations show that coincident infection with malaria and typhoid fever may occur, the resulting complex of symptoms are not sufficiently well defined and uniform to be recognized as a separate disease.*

We have in the body of this report devoted a special chapter to this subject, to which those desiring detailed information are referred.

(45) *About one-fifth of the soldiers in the national encampments in the United States in 1898 developed typhoid fever.*

Among 107,973 officers and men in 92 regiments, the records of which we have carefully studied, the number cases of typhoid fever, according to our estimate, was 20,738. This is equivalent to 19.26 per cent.

(49) *In military practice typhoid fever is often apparently an intermittent disease.*

We have stated that typhoid fever is often apparently an intermittent disease. We do not mean that the apparent intermissions are afebrile; we only mean that the men sick with this disease had periods of improvement, and these were so marked that regimental surgeons sometimes returned to duty, probably at the request of the men, those who were sick with typhoid fever.

(50) *The belief that errors in diet with consequent gastric and intestinal catarrh in-*

duce typhoid fever is not supported by our investigations.

This belief, which was formerly held by many, is founded upon false conclusions arising from erroneous conceptions of the etiology of the disease. Moreover, the early symptoms of typhoid fever are often confounded with those of simple gastro-intestinal catarrh.

(51) The belief that simple gastro-intestinal disturbances predispose to typhoid fever is not supported by our investigations.

As has been elsewhere stated, the members of this board began their investigations with the belief, which seems to be quite generally held, that acute diseases of the gastro-intestinal tract render the individual more susceptible to subsequent infection with typhoid fever. However, our studies have forced us to come to the following conclusions concerning the relations between typhoid fever and preceding temporary disorders, including those diagnosed as diarrhea, enteritis, gastro-enteritis, gastro-duodenitis, intestinal catarrh, gastro-intestinal catarrh, gastric fever, and simple indigestion:

(a) The temporary gastro-intestinal disturbances of May and June had little if any effect upon subsequent infection with typhoid fever.

(b) The temporary gastro-intestinal disturbances of July and August, instead of predisposing to typhoid fever, gave a certain degree of immunity against subsequent infection with this disease. Our investigations may be summarized as follows:

Of 9,481 men who had previous diarrheal attacks, 648, or 6.8 per cent., contracted typhoid fever; whereas of 46,348 soldiers who had no preceding diarrhea, 7,097, or 15.3 per cent., developed typhoid fever.

(52) In a considerable per cent. (a little more than one-third) of the cases of typhoid fever which are recorded as having been preceded by some intestinal disturbance, the preceding illness was so closely followed by typhoid fever that we must regard the former as having occurred within the period of incubation of the latter.

For particulars on this point see the chapter on etiology.

(53) More than 90 per cent. of the men who developed typhoid fever had no preceding intestinal disorder.

In 7,745 cases in which this point was especially investigated 7,097 (91.63 per cent.) were not preceded by any intestinal disorder.

(57) The average period of incubation in typhoid fever is probably about ten and a half days.

Our data are not sufficient to enable us to make any positive deduction on this point, but from a careful study of 780 cases of typhoid fever in which the period of incubation was based upon the average interval between connectable typhoid attacks in tents or between diarrheal and typhoidal attacks in the same individual this was found to be 10.4 days. The shortest period of incubation would appear to be slightly less than eight days.

Review of Diseases for June, 1901.

NINETY-ONE COUNTIES REPORTING.

Ninety-four counties have Superintendents of Health.

Except in the case of the more contagious and dangerous diseases the Superintendent has, as a rule, to rely upon his own information alone, since few physicians can be induced to report cases of non-contagious diseases to him.

Where the number of cases is not given

or the prevalence of a disease otherwise indicated, its mere presence in the county is to be understood as reported.

For the month of June the following diseases have been reported from the counties named:

MEASLES.—Alexander, a few cases; Beaufort, 1; Brunswick, several; Buncombe, 3; Burke, 2; Caldwell, 20; Carteret; Columbus, a few; Currituck, a great many; Duplin, 2; Graham, several; Granville, 4; Haywood, several; Henderson, 13; Hyde, in all parts; Johnston; Lincoln, 6; Macon, a few; Montgomery; Moore, many; Perquimans, 50; Randolph, many; Richmond, 5; Rockingham; Stokes, 20; Watauga, epidemic; Yadkin, general—27 counties.

WHOOPING-COUGH.—Cabarrus, 26; Caldwell, 10; Caswell, 1; Catawba, 4; Chatham; Cleveland, several; Cumberland, a few; Currituck, several; Durham, several; Granville, 6; Iredell, several; Johnston; Montgomery, 5; Moore, many; New Hanover, 6; Orange; Polk, 8; Randolph, general; Rockingham, a great many; Rutherford, a few; Scotland, 11; Vance, in all parts; Wake, 5; Watauga, many; Wayne, a few; Wilson, 3; Yancey, several—27 counties.

SCARLATINA.—Buncombe, 14; Cleveland, a few; Davidson, 2; Durham, 4; Iredell, 1; New Hanover, 1; Rowan, 1—7 counties.

DIPHTHERIA.—Cabarrus, 1; New Hanover, 2; Polk, 1.

TYPHOID FEVER.—Alamance, 5; Alexander, in all parts; Anson, a few; Ashe, 2; Beaufort, 2; Brunswick, 5; Buncombe, 3; Burke, 8; Cabarrus, 8; Caldwell, 6; Chatham, a few, of severe type; Cleveland, several; Columbus, 4; Craven, 6; Duplin, 4; Durham, 6; Edgecombe, 3; Franklin, 12 or 15; Gaston; Graham, 1; Granville, 4; Greene, 4; Halifax, 1;

Harnett, a few; Hertford, 1; Iredell, 4; Jones, 2; McDowell, 8; Macon, 6; Mecklenburg, 4; Montgomery, 12; Nash, 7; New Hanover, 14; Northampton, many; Onslow, 3; Pender, 3; Perquimans, 2; Polk, 9; Randolph, 10; Richmond, 10; Robeson, a great many; Rockingham, Rowan, 3; Sampson, a few; Scotland, 41; 20 or 30 of them at one cotton-mill; Stanly; Stokes, 3; Surry, 2; Swain, 6; Union, several; Vance, a few; Wake, 10; Warren, 3; Wayne, several; Wilkes; Yadkin, a few; Yancey, a few—57 counties.

MALARIAL FEVER.—Alamance, in all parts; Anson; Beaufort; Brunswick; Caswell; Chatham; Cherokee, 4 cases of bilious fever; Craven, in all parts; Currituck; Gates; Graham, 1; Greene, in all parts; Guilford; Halifax; Hertford; Hyde; Iredell, 8; Jones; Montgomery; New Hanover, in all parts; Onslow; Person; Sampson; Warren; Washington, in all parts; Wayne; Wilkes; Wilson—27 counties.

MALARIAL FEVER, PERNICIOUS.—Beaufort, 1; Hertford, 1; Hyde, 2; Washington, 2.

MALARIAL FEVER HEMORRHAGIC.—Washington, 1; Wilson.

DIARRHOEAL DISEASES, INCLUDING DYSENTERY.—Alamance; Alleghany, in all parts; Anson; Bertie; Brunswick; Burke, in all parts; Caswell, in all parts; Catawba; Chatham; Cherokee, 30; Columbus, in all parts; Currituck; Duplin; Gates, in all parts; Graham; Granville; Greene, in all parts; Halifax; Harnett; Haywood; Jones; Lenoir; Lincoln; McDowell; Mecklenburg; Mitchell; Moore; Orange, in all parts; Pasquotank; Perquimans; Person; Randolph; Robeson; Rockingham; Rutherford; Sampson; Stokes; Surry; Swain; Wake; Watauga; Wayne; Yancey—43 counties.

INFLUENZA.—Union, a few cases.

MUMPS.—Caldwell, a few cases.

SMALL-POX.—Alamance, 9; Buncombe, 9; Burke, 1; Caswell, 1; Cleveland, 6; Cumberland, 2; Durham, 10; Gaston, 8 (on July 4); Guilford, 6, one of these was of the hemorrhagic form and fatal; McDowell, 5; Mecklenburg, 8; Orange, 14; Person, 49; Rockingham, 2; Rowan, 1; Sampson, 1; Stanly, 3; Wake, 7.

Dr. J. W. Fulton, the Superintendent of Health of Cherokee, writes: "I visited the territory of the so-called small-pox. I saw a number of the patients and examined them carefully, and if it is small-pox, it is not any small-pox that I have seen heretofore. It is on the line of this State and Georgia. There have been, I suppose, one hundred cases, with no deaths that can be attributed to the disease that I know of. I have advised steps to be taken to confine the disease within the neighborhood."

Dr. J. G. Waldrop, Superintendent of Health of Henderson county, says: "We still have a few cases of what all our physicians who see it call chicken-pox, in severe form. I feel certain it is that, but it is frightful in some cases. I try to persuade them to keep others away."

VARICELLA.—Wilson, a few.

CHOLERA IN CHICKENS.—Clay.

CHOLERA IN HOGS.—Bertie, Columbus,

Hyde, Northampton, Pender, Richmond and Robeson—7 counties.

No diseases reported from Bladen, Chowan, Dare, Davie, Forsyth, Madison and Pitt.

No reports from Jackson, Martin and Transylvania.

Summary of Mortuary Reports for June, 1901.

(TWENTY-ONE TOWNS).

Aggregate popula- tion.....	White.	Col'd.	Total.
Aggregate deaths...	63,870	39,760	103,630
Representing tem- porary annual death rate per 1,000.....	102	111	213
	19.2	33.5	24.7
<i>Causes of Death.</i>			
Typhoid Fever.....	5	4	9
Malarial fever	1	2	3
Whooping-cough ..	0	6	6
Measles	1	0	1
Pneumonia.....	5	2	7
Consumption.....	9	13	22
Brain diseases.....	5	4	9
Heart diseases.....	2	7	9
Neurotic diseases...	3	3	6
Diarrhoeal diseases	27	25	52
All other diseases..	40	41	81
Accident	3	4	7
Violence	1	0	1
	102	111	213
Deaths under five years.....	45	46	91
Still-born.....	1	7	8

Mortuary Report for June, 1901.

TOWNS AND REPORTERS.	RACES.	POPULATION.		TEMPORARY ANNUAL DEATH RATE PER 1,000.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrheal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	TOTAL DEATHS.		
		By Races.	Total.	By Races.	Total.																	By Races.	By Towns.	Deaths under five years.	Still-born
Asheville.....	W.	9,700		21.0		..	..	..	..	..	..	..	4	..	..	..	6	5	2	..	17	33	6	..
Dr. C. V. Reynolds.	C.	5,000	14,700	38.4	27.0	1	..	..	..	..	..	1	1	1	1	..	4	7	..	..	16	..	5	1
Charlotte.....	W.	12,000		25.0		..	..	..	..	..	..	2	..	..	..	..	4	15	..	..	25	44	10	..
Dr. F. O. Hawley.	C.	6,100	18,100	37.4	29.2	3	..	..	..	..	..	1	2	..	..	..	3	8	1	..	19	..	7	1
Fayetteville.....	W.	2,800		17.1		..	..	..	..	..	..	..	..	..	..	..	3	1	..	..	4	8	4	..
Dr. John D. MacRae.	C.	1,900	4,700	25.2	20.4	..	..	..	..	1	..	..	..	..	..	..	1	1	..	..	4	...	3	..
Henderson.....	W.	2,100		17.1		..	..	..	..	..	..	1	..	..	..	..	1	..	1	..	3	9	3	..
Dr. F. R. Harris.	C.	1,700	3,800	42.3	28.4	..	..	..	..	..	..	..	..	..	1	..	5	..	..	..	6	...	2	..
Laurinburg.....	W.	900		0.0		..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	0	3	...	..
Dr. A. W. Hamer.	C.	600	1,500	60.0	24.0	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	3	3	...	..
Marion.....	W.	800		51.4		2	..	..	..	..	..	..	1	..	..	..	..	..	..	..	3	3	...	..
Dr. B. A. Cheek.	C.	350	1,150	0.0	31.3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	...	...	..
Monroe.....	W.	1,850		0.0		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	0	...	..
Dr. J. M. Blair.	C.	600	2,450	0.0	0.0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	...	...	..
Oxford.....	W.	1,200		10.0		..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	1	...	..
Dr. S. D. Booth.	C.	900	2,100	0.0	5.7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	...	...	..
Reidsville.....	W.	2,000		12.0		..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	2	4	...	..
Jas. T. Smith, Cy. Cl.	C.	1,260	3,260	19.0	11.6	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	2	...	1	..
Rockingham.....	W.	1,100		65.4		1	..	..	..	..	..	..	..	..	..	..	1	3	..	..	5	11	3	..
Dr. Wm. P. Webb.	C.	500	1,600	120.0	82.5	..	..	..	..	..	..	..	1	1	..	..	3	..	..	..	6	...	3	..
Rocky Mount.....	W.	1,850		0.0		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	3	...	..
Dr. G. L. Wimberley, Jr.	C.	1,100	2,950	32.7	12.2	..	..	..	..	..	..	..	1	..	..	..	2	..	..	..	3	...	...	..
Salem.....	W.	3,300		40.0		..	..	..	..	..	1	1	..	..	..	..	9	..	..	..	11	11	9	..
J. A. Vance, Mayor.	C.	350	3,650	0.0	36.2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	...	...	..
Salisbury.....	W.	4,300		11.2		..	..	..	..	..	..	..	1	2	..	..	1	..	..	..	4	9	1	..
Dr. W. W. McKenzie.	C.	2,000	6,300	30.0	15.5	..	..	..	..	..	..	..	2	..	..	..	3	..	..	..	5	...	2	..
Scotland Neck.....	W.	1,000		36.0		..	..	..	..	..	..	1	..	..	..	..	2	..	..	..	3	3	...	..
Dr. J. P. Wimberley.	C.	500	1,500	0.0	24.0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	...	...	..
Smithfield.....	W.	620		0.0		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	0	...	..
J. C. Bingham, Mayor.	C.	450	1,070	0.0	0.0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	...	...	..
Southport.....	W.	900		0.0		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	2	...	..
Dr. D. I. Watson.	C.	500	1,400	48.0	17.1	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	2	...	...	..
Tarboro.....	W.	2,000		6.0		..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	2	...	..
Dr. L. L. Staton.	C.	500	2,500	24.0	9.6	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	...	...	..
Washington.....	W.	2,900		16.5		1	..	..	..	..	..	..	1	1	..	..	1	..	..	..	4	13	1	..
Dr. Jno. G. Blount.	C.	2,000	4,900	54.0	31.8	..	1	..	1	..	..	..	1	1	..	..	1	4	..	..	9	...	4	..
Weldon.....	W.	700		24.3		..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	2	3	...	..
J. T. Gooch, Mayor.	C.	750	1,450	16.0	24.8	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	...	...	..
Wilmington.....	W.	10,000		15.6		1	..	..	..	..	..	..	2	2	4	5	..	..	..	..	113	5	1	..
Dr. Chas. T. Harper.	C.	11,000	21,000	30.5	23.4	..	1	..	1	..	..	2	1	2	3	9	7	3	..	..	28	41	17	5
Wilson.....	W.	1,850		19.5		..	..	1	..	..	..	..	..	..	..	1	1	..	..	..	3	10	1	..
Dr. W. S. Anderson.	C.	1,700	3,550	49.4	33.8	..	..	..	3	..	..	..	1	..	..	..	3	..	..	..	7	...	...	..

N. B.—The reporters for the cities and towns printed in **Black Type** have signed this certificate: "I hereby certify that this report gives the *whole* number of deaths occurring within the corporate limits during the above month." The total populations are taken from the census report for 1900, but the division into races is estimated, as those figures have not been given out.

County Superintendents of Health.

Alamance	Dr. H. R. Moore.	Jones.....	Dr. S. E. Koonce.
Alexander	Dr. C. J. Carson.	Lenoir	Dr. Raymond Pollock.
Alleghany	Dr. B. C. Waddell.	Lincoln	Dr. T. F. Costner.
Anson	Dr. J. H. Bennett.	McDowell	Dr. B. A. Cheek.
Ashe.....	Dr. J. W. Colvard.	Macon	Dr. F. L. Siler.
Beaufort	Dr. Jno. G. Blount.	Madison	Dr. Jas. K. Hardwicke.
Bertie	Dr. H. V. Dunstan.	Martin.....	Dr. W. H. Harrell.
Bladen.....	Dr. Newton Robinson.	Mecklenburg.....	Dr. C. S. McLaughlin.
Brunswick	Dr. J. A. McNeill.	Mitchell.....	Dr. V. R. Butt.
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Columbus.....	Dr. I. Jackson.		house.
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Jackson.....	Dr. Wm. Self.	Yadkin	Dr. S. L. Russell.
Johnston	Dr. L. D. Wharton.	Yancey	Dr. W. M. Austin.

[You are asked to fill out and mail one of these forms to the Superintendent of Health of your county on or before the third of each month, that he may use it in making his report to the Secretary of the State Board.]

Have any of the following diseases occurred in your practice during the month just closed. If so, state number of cases.

Whooping-cough ----- Typhoid Fever -----

Measles ----- Typhus Fever -----

Diphtheria ----- Yellow Fever -----

Scarlet Fever ----- Cholera -----

Pernicious Malarial Fever ----- Smallpox -----

Hemorrhagic Malarial Fever ----- Cerebro-spinal Meningitis -----

What have been the prevailing diseases in your practice?

Has any epidemic occurred among domestic animals? If so, what?

What is the sanitary condition of your section, public and private?

General Remarks: -----

BULLETIN

OF THE

North Carolina Board of Health.

Published Monthly at the Office of the Secretary of the Board, Raleigh, N. C.

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RICHARD H. LEWIS, M. D., *Secretary and Treasurer*, Raleigh.

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No. 5.

**The Fight Against Tuberculosis in the
Light of the Experience Gained in
Successful Combat of Other Infec-
tious Diseases.***

PROF. ROBERT KOCH, GEH. MED. RATH.

Direktor des Instituts für Infektionskrankheiten
in Berlin und Mitglied des Kaiserl.
Gesundh. Amtes.
BERLIN, GERMANY.

[The chief object aimed at in the publication of the BULLETIN is to bring the medical profession of the State in touch and sympathy with the Board of Health, to interest them in preventive medicine and as far as possible secure their all-important aid in disseminating among their clientele, which includes all the people, its principles and their application. Tuberculosis is by long odds the most widespread and deadly of all the preventable diseases and is unfortunately a subject of

anxious personal interest to most of us, lay as well as professional. We therefore gladly avail ourself of the opportunity to lay before our readers (it is not too technical to be appreciated by the layman) the latest expression of the views of the highest authority on the subject, living or dead, Professor Robert Koch, of Berlin. We also append remarks upon the address by Professor MacFayden and others and an editorial on the address from one of the ablest of our medical journals, *The New York Medical Journal* of August 3d. Prof. Koch's address is reprinted from *The Journal of the American Medical Association* of July 27.—EDITOR.]

The task with which this Congress will have to busy itself is one of the most difficult, but it is also one in which labor is most sure of its reward.

I need not point again to the innumerable victims tuberculosis annually claims

*An address delivered before a general meeting of the British Congress on Tuberculosis, London, July 23d.

in all countries, nor to the boundless misery it brings on the families it attacks. You all know that there is no disease which inflicts such deep wounds on mankind as this. All the greater, however, would be the general joy and satisfaction if the efforts that are being made to rid mankind of this enemy, which consumes its inmost marrow, were crowned with success.

There are many, indeed, who doubt the possibility of successfully combating this disease, which has existed for thousands of years, and has spread all over the world. This is by no means my opinion. This is a conflict into which we may enter with a surely founded prospect of success, and I will tell you the reason on which I base this conviction.

TUBERCULOSIS A PREVENTABLE DISEASE.

Only a few decades ago the real nature of tuberculosis was unknown to us; it was regarded as a consequence, as the expression, so to speak, of social misery, and, as this supposed cause could not be got rid of by simple means, people relied on the probable gradual improvement of social conditions, and did nothing. All this is altered now. We know that social misery does indeed go far to foster tuberculosis, but the real cause of the disease is a parasite—that is, a visible and palpable enemy which we can pursue and annihilate, just as we can pursue and annihilate other parasitic enemies of mankind.

Strictly speaking, the fact that tuberculosis is a preventable disease ought to have become clear as soon as the tubercle bacillus was discovered, and the properties of this parasite and the manner of its transmission became known. I may add that I, for my part, was aware of the

full significance of this discovery from the first, and so will everybody have been who had convinced himself of the causal relation between tuberculosis and the tubercle bacillus. But the strength of a small number of medical men was inadequate to the conflict with a disease so deeply rooted in our habits and customs. Such a conflict requires the co-operation of many, if possible of all, medical men, shoulder to shoulder with the State and the whole population. The moment when such co-operation is possible seems now to have come. I suppose there is hardly any medical man now who denies the parasitic nature of tuberculosis, and among the non-medical public, too, the knowledge of the nature of the disease has been widely propagated.

Another favorable circumstance is that success has recently been achieved in combating several parasitic diseases, for we have learned from these examples how the conflict with pestilences is to be carried on.

SPECIAL PREVENTIVE MEASURES NEEDED FOR VARIOUS DISEASES.

The most important lesson we have learned from this experience is that it is a great blunder to treat pestilences according to a general scheme. This was done in former times; no matter whether the pestilence in question was cholera, plague, or leprosy; isolation, quarantine, useless disinfection were always resorted to. But now we know that every disease must be treated according to its own special individuality, and that the measures to be taken against it must be most accurately adapted to its special nature, to its etiology. We are entitled to hope for success in combating tuberculosis only if we keep this lesson constantly in view. As so very much depends just on

this point, I shall take the liberty to illustrate it by several examples.

Plague.—The pestilence which is at this moment in the foreground of interest, the bubonic plague, may be instructive to us in several respects.

People used to act upon the conviction that a plague patient was in the highest degree a center of infection, and that the disease was transmitted only by plague patients and their belongings. Even the most recent international agreements are based on this conviction. Although, as compared with formerly, we now have the great advantage that we can, with the aid of the microscope and of experiments on animals, recognize every case of plague with absolute certainty, and although the prescribed inspection of ships, quarantine, the isolation of patients, the disinfection of infected dwellings and ships are carried out with the utmost care, the plague has, nevertheless, been transmitted everywhere, and has in not a few places assumed grave dimensions. Why this has happened we know very well, owing to the experience quite recently gained as to the manner in which the plague is transmitted. It has been discovered that only those plague patients that suffer from plague-pneumonia—a condition which is fortunately infrequent—are centers of infection, and that the real transmitters of the plague are the rats. There is no longer any doubt that, in by far the majority of cases in which the plague has been transmitted by ocean traffic, the transmission took place by means of plague among the ship rats. It has also been found that wherever the rats were intentionally or unintentionally exterminated the plague rapidly disappeared; whereas at other places, where too little attention had been paid to the

rat plague, the pestilence continued. This connection between the human plague and the rat plague was totally unknown before, so that no blame attaches to those who devised the measures now in force against the plague if these measures had proved unavailing. It is high time, however, that this enlarged knowledge of the etiology of plague be utilized in international as well as in other traffic. As human plague is so dependent on rat plague, it is intelligible that protective inoculation and the application of antitoxic serum have so little effect. A certain number of human beings may have been saved from the disease by that, but the general spread of the pestilence has not been hindered in the least.

Cholera.—With cholera the case is essentially different; it may under certain circumstances be transmitted directly from human beings to other human beings, but its main and most dangerous propagator is water, and therefore, in the combating of cholera, water is the first thing to be considered. In Germany, where this principle has been acted on, we have succeeded for four years in regularly exterminating the pestilence (which was introduced again and again from the infected neighboring countries) without any obstruction of traffic.

Hydrophobia.—Hydrophobia, too, is not void of instruction for us. Against this disease the so-called protective inoculation proper has proved eminently effective as a means of preventing the outbreak of the disease in persons already infected, but, of course, such a measure can do nothing to prevent infection itself. The only real way of combating this pestilence is by compulsory muzzling. In this matter also we have had the most satisfactory experi-

ence in Germany, but have at the same time seen that the total extermination of the pestilence can only be achieved by international measures, because hydrophobia, which can be very easily and rapidly suppressed, is always introduced again year after year from the neighboring countries.

Leprosy.—Permit me to mention only one other disease, because it is etiologically very closely akin to tuberculosis, and we can learn not a little for the furtherance of our aims from its successful combating. I mean leprosy. It is caused by a parasite which greatly resembles the tubercle bacillus. Just like tuberculosis, it does not break out till long after infection, and its course is almost slower. It is transmitted only from person to person, but only when they come into close contact, as in small dwellings and bedrooms. In this disease, accordingly, immediate transmission plays the main part; transmission by animals, water, or the like is out of the question. The combative measures, accordingly, must be directed against this close intercourse between the sick and the healthy. The only way to prevent this intercourse is to isolate the patients. This was most rigorously done in the Middle Ages by means of numerous leper houses, and the consequence was that leprosy, which had spread to an alarming extent, was completely stamped out in Central Europe. The same method has been adopted quite recently in Norway, where the segregation of lepers has been ordered by a special law. But it is exceedingly interesting to see how this law is carried out. It has been found that it is not at all necessary to execute it strictly, for the segregation of only the worst cases, and even of only a part of these, sufficed to

produce a dimunition of leprosy. Only so many infectious cases had to be sent to the leper houses that the number of fresh cases kept regularly diminishing from year to year. Consequently the stamping-out of the disease had lasted much longer than it would have lasted if every leper had been inexorably consigned to a leper house, as in the Middle Ages; but in this way, too, the same purpose is gained—slowly, indeed, but without any harshness.

SPUTUM THE MAIN SOURCE OF INFECTION IN TUBERCULOSIS.

These examples may suffice to show what I am driving at, which is to point out that, in combating pestilences, we must strike at the root of the evil, and must not squander force in subordinate ineffective measures. Now the question is, what has hitherto been done, and what is about to be done against tuberculosis, that really strikes the root of tuberculosis, so that it must sooner or later die.

In order to answer this question it is necessary first and foremost to inquire how infection takes place in tuberculosis. Of course, I presuppose that we understand by tuberculosis only those morbid conditions which are caused by the tubercle bacillus.

In by far the majority of cases of tuberculosis the disease has its seat in the lungs, and has also begun there. From this fact it is justly concluded that the germs of the disease, that is, the tubercle bacilli, must have got into the lungs by inhalation. As to the question where the inhaled tubercle bacilli have come from, there is also no doubt. On the contrary, we know with certainty that they get into the air with the sputum of consumptive patients. This sputum,

especially in advanced stages of the disease, almost always contains tubercle bacilli, sometimes in incredible quantities. By coughing, and even speaking, it is flung into the air in little drops, that is, in a moist condition, and can at once infect persons who happen to be near the coughers. But it may also be pulverized when dried, in the linen or on the floor, for instance, and get into the air in the form of dust.

In this manner a complete circle, a so-called *circulus vitiosus*, has been formed for the process of infection from the diseased lung, which produces phlegm and pus containing tubercle bacilli, to the formation of moist and dry particles (which, in virtue of their smallness, can keep floating a good while in the air), and finally to new infection, if particles penetrate with the air into a healthy lung and originate the disease anew. But the tubercle bacilli may get to other organs of the body in the same way, and thus originate other forms of tuberculosis. This, however, is considerably rarer. The sputum of consumptive people, then, is to be regarded as the main source of the infection of tuberculosis. On this point, I suppose, we are all agreed. The question now arises whether there are not other sources too, copious enough to demand consideration in the combating of tuberculosis.

Great importance used to be attached to the hereditary transmission of tuberculosis. Now, however, it has been demonstrated by thorough investigation that, though hereditary tuberculosis is not absolutely non-existent, it is nevertheless extremely rare, and we are at liberty, in considering our practical measures, to leave this form of origination entirely out of account.

DIFFERENCE BETWEEN HUMAN AND BOVINE TUBERCULOSIS.

But another possibility of tuberculous infection exists, as is generally assumed, in the transmission of the germs of the disease from tuberculous animals to man. This manner of infection is generally regarded nowadays as proved, and as so frequent that it is even looked upon by not a few as the most important, and the most rigorous measures are demanded against it. In this Congress also the discussion of the danger with which the tuberculosis of animals threatens man will play an important part. Now, as my investigations have led me to form an opinion deviating from that which is generally accepted, I beg your permission, in consideration of the great importance of this question, to discuss it a little more thoroughly.

Genuine tuberculosis has hitherto been observed in almost all domestic animals, and most frequently in poultry and cattle. The tuberculosis of poultry, however, differs so much from human tuberculosis that we may leave it out of account as a possible source of infection for man. So, strictly speaking, the only kind of tuberculosis remaining to be considered is the tuberculosis of cattle, which, if really transferable to man, would indeed have frequent opportunities of infecting human beings through the drinking of the milk and the eating of the flesh of diseased animals.

Even in my first circumstantial publication on the etiology of tuberculosis I expressed myself regarding the identity of human tuberculosis and bovine tuberculosis with reserve. Proved facts, which would have enabled me to sharply distinguish these two forms of the disease, were not then at my disposal, but sure

proofs of their absolute identity were equally undiscoverable, and I therefore had to leave this question undecided. In order to decide it I have repeatedly resumed the investigations relating to it, but so long as I experimented on small animals, such as rabbits and guinea-pigs, I failed to arrive at any satisfactory result, though indications which rendered the difference of the two forms of tuberculosis probable were not wanting. Not till the complaisance of the Ministry of Agriculture enabled me to experiment on cattle, the only animals really suitable for these investigations, did I arrive at absolutely conclusive results. Of the experiments which I have carried out during the last two years, along with Professor Schütz, of the Veterinary College in Berlin, I will tell you briefly some of the most important.

A number of young cattle which had stood the tuberculin test, and might therefore be regarded as free from tuberculosis, were infected in various ways with tubercle bacilli taken from cases of human tuberculosis; some of them got the tuberculous sputum of consumptive patients direct. In some cases the tubercle bacilli or the sputum were injected under the skin, in others into the peritoneal cavity, in others into the jugular vein. Six animals were fed with tuberculous sputum almost daily for seven or eight months; four repeatedly inhaled great quantities of bacilli, which were distributed in water and scattered with it in the form of spray. None of these cattle (there were nineteen of them) showed any symptoms of disease, and they gained considerably in weight. From six to eight months after the beginning of the experiments they were killed. In their internal organs not a trace of tuberculosis was found. Only at

the places where the injections had been made small suppurative foci had formed, in which few tubercle bacilli could be found. This is exactly what one finds when one injects dead tubercle bacilli under the skin of animals liable to contagion. So the animals we experimented on were affected by the living bacilli of human tuberculosis exactly as they would have been by dead ones; they were absolutely insusceptible to them.

The result was utterly different, however, when the same experiment was made on cattle free from tuberculosis with tubercle bacilli that came from the lungs of an animal suffering from bovine tuberculosis. After an incubation period of about a week the severest tuberculous disorders of the internal organs broke out in all the infected animals. It was all one whether the infecting matter had been injected only under the skin or into the peritoneal cavity or the vascular system. High fever set in and the animals became weak and lean; some of them died after a month and a half to two months, others were killed in a miserably sick condition after three months. After death extensive tuberculous infiltrations were found at the place where the injections had been made, and in the neighboring lymphatic glands, and also far advanced alterations of the internal organs, especially the lungs and the spleen. In the cases in which the injection had been made into the peritoneal cavity the tuberculous growths which are so characteristic of bovine tuberculosis were found on the omentum and peritoneum. In short, the cattle proved just as susceptible to infection by the bacillus of bovine tuberculosis as they had proved insusceptible to infection by the bacillus of human tuberculosis. I wish only to add that preparations of the organs of

the cattle which were artificially infected with bovine tuberculosis in these experiments are exhibited in the Museum of Pathology and Bacteriology.

An almost equally striking distinction between human and bovine tuberculosis was brought to light by a feeding experiment with swine. Six young swine were fed daily for three months with the tuberculous sputum of consumptive patients. Six other swine received bacilli of bovine tuberculosis with their daily food for the same period. The animals that were fed with the sputum remained healthy and grew lustily, whereas those that were fed with the bacilli of bovine tuberculosis soon became sickly, were stunted in their growth, and half of them died. After three months and a half the surviving swine were all killed and examined. Among the animals that had been fed with sputum no trace of tuberculosis was found, except here and there little nodules in the lymphatic glands of the neck, and in one case a few gray nodules in the lungs. The animals, on the other hand, which had eaten the bacilli of bovine tuberculosis had, without exception (just as in the cattle experiment), severe tuberculous diseases, especially tubercular infiltration of the greatly enlarged lymphatic glands of the neck and of the mesenteric glands, and also extensive tuberculosis of the lungs and the spleen.

The difference between human and bovine tuberculosis appeared not less strikingly in a similar experiment with asses, sheep, and goats, into whose vascular systems the two kinds of tubercle bacilli were injected.

Our experiments, I must add, are not the only ones that have led to this result. If one studies the older literature of the subject, and collates the reports of the

numerous experiments that were made in former times by Chauveau, Günther and Harms, Bollinger and others, who fed calves, swine and goats with tuberculous material, one finds that the animals that were fed with milk and pieces of the lungs of tuberculous cattle always fell ill of tuberculosis, whereas those that received human material with their food did not. Comparative investigations regarding human and bovine tuberculosis have been made very recently in North America by Smith, Dinwiddie, Frothingham, and Repp, and their result agreed with ours. The unambiguous and absolutely conclusive results of our experiments is due to the fact that we chose methods of infection which exclude all sources of error, and carefully avoided everything connected with the stalling, feeding, and tending of the animals that might have a disturbing effect on the experiments.

Considering all these facts, I feel justified in maintaining that human tuberculosis differs from bovine, and cannot be transmitted to cattle. It seems to me very desirable, however, that these experiments should be repeated elsewhere in order that all doubt as to the correctness of my assertion may be removed.

I wish only to add that, owing to the great importance of this matter, our government has resolved to appoint a commission to make further inquiries on the subject.

IS MAN SUSCEPTIBLE TO BOVINE TUBERCULOSIS?

But, now, how is it with the susceptibility of man to bovine tuberculosis? This question is far more important to us than that of the susceptibility of cattle to human tuberculosis, highly important as that is, too. It is impossible to give this question a direct answer,

because, of course, the experimental investigation of it with human beings is out of the question. Indirectly, however, we can try to approach it. It is well known that the milk and butter consumed in great cities very often contain large quantities of the bacilli of bovine tuberculosis in a living condition, as the numerous infection experiments with such dairy products on animals have proved. Most of the inhabitants of such cities daily consume such living and perfectly virulent bacilli of bovine tuberculosis, and unintentionally carry out the experiment which we are not at liberty to make. If the bacilli of bovine tuberculosis were able to infect human beings, many cases of tuberculosis caused by the consumption of aliment containing tubercle bacilli could not but occur among the inhabitants of great cities, especially the children. And most medical men believe that this is actually the case.

In reality, however, it is not so. That a case of tuberculosis has been caused by aliment can be assumed with certainty only when the intestine suffers first—that is, when a so-called primary tuberculosis of the intestine is found. But such cases are extremely rare. Among many cases of tuberculosis examined after death, I myself remember having seen primary tuberculosis of the intestine only twice. Among the great postmortem material of the Charité Hospital in Berlin ten cases of primary tuberculosis of the intestine occurred in five years. Among 933 cases of tuberculosis in children at the Emperor Frederick's Hospital for Children, Baginsky never found tuberculosis of the intestine without simultaneous disease of the lungs and the bronchial glands. Among 3,104 postmortem examinations of tuberculous children, Biedert

observed only sixteen cases of primary tuberculosis of the intestine. I could cite from the literature of the subject many more statistics of the same kind, all indubitably showing that primary tuberculosis of the intestine, especially among children, is a comparatively rare disease, and of these few cases that have been enumerated it is by no means certain they were due to infection by bovine tuberculosis. It is just as likely that they were caused by the widely-propagated bacilli of human tuberculosis, which may have got into the digestive canal in some way or other—for instance, by swallowing saliva from the mouth. Hitherto nobody could decide with certainty in such a case whether the tuberculosis of the intestine was of human or animal origin. Now we can make the diagnosis. All that is necessary is to cultivate in pure culture the tubercle bacilli found in the tuberculous material, and to ascertain whether they belong to bovine tuberculosis by inoculating cattle with them. For this purpose I recommend subcutaneous injection, which yields quite specially characteristic and convincing results. For half a year past I have occupied myself with such investigations, but, owing to the rareness of the disease in question, the number of the cases I have been able to investigate is but small. What has hitherto resulted from this investigation does not support the assumption that bovine tuberculosis occurs in man.

Though the important question whether man is susceptible to bovine tuberculosis at all is not yet absolutely decided, and will not admit of absolute decision to-day or to-morrow, one is nevertheless already at liberty to say that, if such a susceptibility really exists, the infection of human beings is

but a very rare occurrence. I should estimate the extent of the infection by the milk and flesh of tuberculous cattle, and the butter made of their milk, as hardly greater than that of hereditary transmission, and I therefore do not deem it advisable to take any measures against it.

HUMAN SPUTUM THE MAIN SOURCE OF HUMAN TUBERCULOSIS.

So the only main source of the infection of tuberculosis is the sputum of consumptive patients, and the measures for the combating of tuberculosis must aim at the prevention of the dangers arising from its diffusion. Well, what is to be done in this direction? Several ways are open. One's first thought might be to consign all persons suffering from tuberculosis of the lungs, whose sputum contains tubercle bacilli, to suitable establishments. This, however, is not only absolutely impracticable, but also unnecessary. For a consumptive who coughs out tubercle bacilli is not necessarily a source of infection on that account, so long as he takes care that his sputum is properly removed and rendered innocuous. This is certainly true of very many patients, especially in the first stages, and also of those who belong to the well-to-do classes, and are able to procure the necessary nursing. But how is it with people of very small means? Every medical man who has often entered the dwellings of the poor, and I can speak on this point from my own experience, knows how sad is the lot of consumptives and their families there. The whole family have to live in one or two small, ill-ventilated rooms. The patient is left without the nursing he needs, because the able-bodied members of the family must go to their work. How can the necessary cleanliness be

secured under such circumstances? How is such a helpless patient to remove his sputum, so that it may do no harm? But let us go a step further and picture the condition of a poor consumptive patient's dwelling at night. The whole family sleep crowded together in one small room. However cautious he may be, the sufferer scatters the morbid matter secreted by his diseased lungs every time he coughs, and his relatives close beside him must inhale this poison. Thus whole families are infected. They die out, and awaken in the minds of those who do not know the infectiousness of tuberculosis the opinion that it is hereditary, whereas its transmission in the cases in question was due solely to the simplest process of infection, which do not strike people so much, because the consequences do not appear at once, but generally only after the lapse of years.

FOCI OF TUBERCULOUS INFECTION.

Often, under such circumstances, the infection is not restricted to a single family, but spreads in densely inhabited tenement houses to the neighbors, and then, as the admirable investigations of Biggs have shown in the case of the densely-peopled parts of New York, regular nests of foci of disease are formed. But, if one investigates these matters more thoroughly, one finds that it is not poverty *per se* that favors tuberculosis, but the bad domestic conditions under which the poor everywhere, but especially in great cities, have to live. For, as the German statistics show, tuberculosis is less frequent, even among the poor, when the population is not densely packed together, and may attain very great dimensions among a well-to-do population when the domestic conditions, especially as regards the bedrooms, are bad, as is the case, for instance, among

the inhabitants of the North Sea Coast. So it is the overcrowded dwellings of the poor that we have to regard as the real breeding places of tuberculosis; it is out of them that the disease always crops up anew, and it is to the abolition of these conditions that we must first and foremost direct our attention if we wish to attack the evil at its root, and to wage war against it with effective weapons.

This being so, it is very gratifying to see how efforts are being made in almost all countries to improve the domestic conditions of the poor. I am also convinced that these efforts, which must be promoted in every way, will lead to a considerable diminution of tuberculosis. But a long time must elapse ere essential changes can be effected in this direction, and much may be done meanwhile in order to reach the goal much more rapidly.

THE NEED FOR HOSPITALS FOR CONSUMPTIVES.

If we are not able at present to get rid of the danger which small and overcrowded dwellings involve, all we can do is to remove the patients from them, and, in their own interests and that of the people about them, to lodge them better; and this can be done only in suitable hospitals. But the thought of attaining this end by compulsion of any kind is very far from me; what I want is that they may be enabled to obtain the nursing they need better than they can obtain it now. At present a consumptive in an advanced stage of the disease is regarded as incurable and as an unsuitable inmate for a hospital. The consequence is that he is reluctantly admitted and dismissed as soon as possible. The patient, too, when the treatment seems to him to produce no improvement, and the expenses, owing to the long duration

of his illness, weigh heavily upon him, is himself animated by the wish to leave the hospital soon. That would be altogether altered if we had special hospitals for consumptives, and if the patients were taken care of there for nothing, or at least at a very moderate rate. To such hospitals they would willingly go; they could be better treated and fed there than is now the case. I know very well that the execution of the project will have great difficulties to contend with, owing to the considerable outlay it entails. But very much would be gained if, at least in the existing hospitals, which have to admit a great number of consumptives at any rate, special wards were established for them in which pecuniary facilities would be offered them. If only a considerable fraction of the whole number of consumptives were suitably lodged in this way, a diminution of infection, and consequently of the sum total of tuberculosis, could not fail to be the result. Permit me to remind you in this connection of what I said about leprosy. In the combating of that disease also great progress has already been made by lodging only a fair number of the patients in hospitals. The only country that possesses a considerable number of special hospitals for tuberculous patients is England, and there can be no doubt that the diminution of tuberculosis in England, which is much greater than in any other country, is greatly due to this circumstance. I should point to the founding of special hospitals for consumptives and the better utilization of the already existing hospitals for the lodging of consumptives as the most important measures in the combating of tuberculosis, and its execution opens a wide field of activity to the State, to

municipalities, and to private benevolence. There are many people who possess great wealth, and would willingly give of their superfluity for the benefit of their poor and heavily afflicted fellow-creatures, but do not know how to do this in a judicious manner. Here is an opportunity for them to render a real and lasting service by founding consumption hospitals or purchasing the right to have a certain number of consumptive patients maintained in special wards of other hospitals free of expense.

As, however, unfortunately, the aid of the State, the municipalities, and rich benefactors will probably not be forthcoming for a long time yet, we must for the present resort to other measures that may pave the way for the main measure just referred to, and serve as a supplement and temporary substitute for it.

NOTIFICATION.

Among such measures I regard obligatory notification as specially valuable. In the combating of all infectious diseases it has proved indispensable as a means of obtaining certain knowledge as to their state, especially their dissemination, their increase and decrease. In the conflict with tuberculosis also we can not dispense with obligatory notification; we need it not only to inform ourselves as to the dissemination of this disease, but mainly in order to learn where help and instruction can be given, and especially where the disinfection which is so urgently necessary when consumptives die or change their residences has to be effected. Fortunately it is not at all necessary to notify all cases of tuberculosis, nor even all cases of consumption, but only those which, owing to the domestic conditions, are sources of danger to the people about them. Such limited notification has already been

introduced in various places in Norway, for instance, by a special law, in Saxony by a ministerial decree, in New York and in several American towns, which have followed its example. In New York, where notification was optional at first and was afterwards made obligatory, it has proved eminently useful. It has thus been proved that the evils which it used to be feared the introduction of notification for tuberculosis would bring about need not occur, and it is devoutly to be wished that the examples I have named may very soon excite emulation everywhere.

DISINFECTION.

There is another measure, closely connected with notification—namely, disinfection, which, as already mentioned, must be effected when consumptives die or change their residence, in order that those who next occupy the infected dwelling may be protected against infection. Moreover, not only the dwellings but also the infected beds and clothes of consumptives ought to be disinfected.

EDUCATION OF THE PUBLIC.

A further measure, already recognized on all hands as effective, is the instructing of all classes of the people as to the infectiousness of tuberculosis, and the best way of protecting oneself. The fact that tuberculosis has considerably diminished in almost all civilized states of late is attributable solely to the circumstance that knowledge of the contagious character of tuberculosis has been more and more widely disseminated, and that caution in intercourse with consumptives has increased more and more in consequence. If better knowledge of the nature of tuberculosis has alone sufficed to prevent a large number of cases, this must serve us as a significant admonition to make the greatest

possible use of this means, and to do more and more to bring it about that everybody may know the dangers that threaten him in intercourse with consumptives. It is only to be desired that the instructions may be made shorter and more precise than they generally are, and that special emphasis be laid on the avoidance of the worst danger of infection, which is the use of bedrooms and small, ill-ventilated workrooms simultaneously with consumptives. Of course, the instruction must include directions as to what consumptives have to do when they cough and how they are to treat their sputum.

SANATORIA.

Another measure which has come into the foreground of late, and which at this moment plays to a certain extent a paramount part in all efforts for the combating of tuberculosis, works in quite another direction. I mean the founding of sanatoria for consumptives.

That tuberculosis is curable in its early stages must be regarded as an undisputed fact. The idea of curing as many tuberculous patients as possible in order to reduce the number of those that reach the infectious stage of consumption, and thus to reduce the number of fresh cases, was therefore a very natural one. The only question is whether the number of persons cured in this way will be great enough to exercise an appreciable influence on the retrogression of tuberculosis. I will try to answer this question in the light of the figures at my disposal.

According to the business report of the German Central Committee for the Establishment of Sanatoria for the Cure of Consumptives, about 5,500 beds will be at the disposal of these institutions by the end of 1901, and then, if we assume

that the average stay of each patient will be three months, it will be possible to treat at least 20,000 patients every year. From the reports hitherto issued as to the results that have been achieved in the establishments we learn further that about 20 per cent. of the patients that have tubercle bacilli in their sputum lose them by the treatment there. This is the only sure test of success, especially as regards prophylaxis. If we make this the basis of our estimates, we find that 4,000 consumptives will leave these establishments annually as cured. But, according to the statistics ascertained by the German Imperial Office of Health, there are 226,000 persons in Germany over 15 years of age who are so far gone in consumption that hospital treatment is necessary for them. Compared with this great number of consumptives, the success of the establishments in question seems so small that a material influence on the retrogression of tuberculosis in general is not yet to be expected of them. But pray do not imagine that I wish, by this calculation of mine, to oppose the movement for the establishment of such sanatoria in any way. I only wish to warn against an overestimation of their importance which has recently been observable in various quarters, based apparently on the opinion that the war against tuberculosis can be waged by means of sanatoria alone, and that other measures are of subordinate value. In reality the contrary is the case. What is to be achieved by the general prophylaxis resulting from recognition of the danger of infection and the consequent greater caution in intercourse with consumptives is shown by a calculation of Cornet's regarding the decrease of mortality from tuberculosis in Prussia in the years 1889 to 1897. Before 1889 the average was

31.4 per 10,000, whereas in the period named it sank to 21.8, which means that, in that short space of time, the number of deaths from tuberculosis was 184,000 less than was to be expected from the average of the preceding years. In New York, under the influence of the general sanitary measures directed in a simple exemplary manner by Biggs, the mortality from tuberculosis has diminished by more than 35 per cent. since 1886; and it must be remembered that both in Prussia and in New York the progress indicated by these figures is due to the first beginnings of these measures. Considerably greater success is to be expected of their further development. Biggs hopes to have got so far in five years that in the city of New York alone the annual number of deaths from tuberculosis will be 3,000 less than formerly.

Now, I do indeed believe that it will be possible to render the sanatoria considerably more efficient. If strict care be taken that only patients be admitted for whom the treatment of those establishments is well adapted, and if the duration of the treatment be prolonged, it will certainly be possible to cure 50 per cent., and perhaps still more. But even then, and even if the number of sanatoria be greatly increased, the total effect will always remain but moderate. The sanatoria will never render the other measures I have mentioned superfluous. If their number become great, however, and if they perform their functions properly, they may materially aid the strictly sanitary measures in the conflict with tuberculosis.

CONCLUSION.

If now, in conclusion, we glance back once more to what has been done hitherto for the combating of tuber-

culosis, and forward to what has still to be done, we are at liberty to declare with a certain satisfaction that very promising beginnings have already been made. Among these I reckon the consumption hospitals of England, the legal regulations regarding notification in Norway and Saxony, the organization created by Biggs in New York—the study and imitation of which I most urgently recommend to all municipal sanitary authorities—the sanatoria, and the instruction of the people. All that is necessary is to go on developing these beginnings, to test, and if possible to increase their influence on the diminution of tuberculosis, and wherever nothing has yet been done, to follow the examples set elsewhere.

If we allow ourselves to be continually guided in this enterprise by the spirit of genuine preventive medical science, if we utilize the experience gained in conflict with other pestilences, and aim, with clear recognition of the purpose and resolute avoidance of wrong roads, at striking the evil at its root, then the battle against tuberculosis, which has been so energetically begun, cannot fail to have a victorious issue.

TUBERCLE BACILLI IN COWS' MILK AS A SOURCE OF TUBERCULOSIS IN MAN.

Professor MacFadyean strongly controverted the position taken by Koch in his paper read two days previously. He said that the identity of human and bovine tuberculosis was generally supposed to have been finally determined by Koch himself, when he discovered that the bacilli were identical in morphological, tinctorial, and cultural characters. Hundreds of other workers had brought to light additional evidence of this identity, such as the specific reaction in tuberculous cattle from tuber-

culin, whether human or bovine. He did not deny that the bovine bacilli were usually more virulent to cattle and other domesticated animals than human bacilli. But this did not prove that bovine bacilli were only feebly pathogenic to man. Moreover, since these bacilli were highly dangerous to such diverse species as the rabbit, horse, dog, pig, and sheep, it was probable that they were also dangerous to man. As to Dr. Koch's argument that cases of primary intestinal tuberculosis from milk or meat were extremely rare, the observations of others differed. In the Hospital for Sick Children in Great Ormond street, London, Dr. Still found that in 29 per cent. of the cases of tuberculosis primary infection appeared to have taken place through the intestine. In the Children's Hospital at Edinburgh, Dr. Shennan found 28 per cent. The late Sir Richard Thorne was convinced that tuberculous milk was the main cause of *tabes mesenterica* in children. His reason was that the statistics for the last fifty years show a marked decline in the death rate from phthisis—the form of tuberculosis resulting from inhalation, while only a slight decline took place at all ages in the death rate from that form of tuberculosis which is ascribable to alimentary infection; and in children under one year there was a notable increase. The number of persons who became infected by milk could not be ascertained, but some estimate might be formed from certain facts. About 30 per cent. of all the milch cows were tuberculous in some degree. But the milk did not appear to be dangerous until the udder became diseased, and only about 2 per cent. of milch cows were so affected. Milk from a tuberculous udder contained bacilli in enormous numbers, but the disease was not attended by any pain or tenderness for a considerable time, so that the gravity of the condition was not realized. To prevent this danger

Professor MacFadyean advocated periodical examination of cows by competent inspectors. Less effective but more easily carried out measures were a compulsory notification of udder disease, and of any symptoms of tuberculosis in milch cows, and the interdiction of sale of milk from animals suffering from this disease. He also referred to the advantage of heating milk so as to sterilize it. To justify the legislation he advocated it was by no means necessary to contend that the danger from milk equaled that from sputum. The latter was undoubtedly the great cause of the spread of human tuberculosis, and every practicable means of preventing infection in that way should be employed; but he could not concede to milkmen the right to sell tubercle bacilli, even if we were assured that—like Dr. Koch's experimental pigs—we had only to fear the development of "little nodules here and there in the lymphatic glands" of our necks, or "a few gray tubercles in our lungs." Much laughter mingled with loud cheers marked the conclusion of the address.

In the discussion which followed Drs. Nocard of France, Crookshank and Sims Woodhead and Ravenel of the University of Pennsylvania, expressed their views as being in complete accord with those of Professor MacFadyen that bovine tuberculosis was a real danger to man.

Sir J. Crichton Browne moved a vote of thanks to Professor MacFadyean for address which showed how fascinating he had made a rather grim subject. He mentioned that Dr. Brown, the representative of Wisconsin, had telegraphed to his government with the result that the State bacteriologists had already begun experiments. He hoped there would be no delay in this country and that meantime we should run no risks.

Dr. Hamilton, of Aberdeen, seconded the motion, which was also supported by other speakers and carried.

FROM ANOTHER REPORT.

The leader of the opposition was Professor John MacFadyean. The situation was a desperate one. It was Koch against the world; it was Koch against Koch. So long as the words of Koch remained uncombated the very foundations of the treatment of tuberculosis seemed swallowed in the quicksand of the ancient empiricism. MacFadyean submitted the reasoning of Koch to a close analysis and derived therefrom three postulates:

1. That the bacilli in bovine tuberculosis are more virulent for cattle than human tubercle bacilli.

2. This difference is so marked as to be diagnostic.

3. From the rarity of primary intestinal tuberculosis in mankind, as proved by a long line of necropsies, it must be concluded that the human subject is immune against infection of the bovine bacillus, or so slightly susceptible as to need no prophylactic measures.

"Now, with the utmost diffidence," continued Professor MacFadyean, "I venture to submit that at least one of the premises contained in this argument is not well founded, that the others have little or no bearing on the question, and that there still remain reasonable grounds for regarding tuberculous cows' milk as distinctly dangerous to human beings."

The opposition to Koch was further sustained by addresses from Nocard, Hamilton, of Aberdeen, Crookshank, Sims, Woodhead, and Dr. Mazyck Ravenel of Philadelphia. The last-mentioned reported from his own experience five cases of tuberculosis in men produced by accidental inoculation with bovine tubercle.

It was the common sentiment that all the available resources of science must now be directed to the prosecution of experiments

which should tend toward the proof or disproof of Koch's latest opinion. On the day after the reading of Koch's paper Sir James Crichton Browne was in the chair and read to the Congress a cablegram from America. Dr. Horace Manchester Browne, of Milwaukee, had cabled to Wisconsin what Koch had said. He received the following reply: "Cable received; question considered; experiments begin to-morrow." In reading this message, which was tense with American energy, Sir Crichton Browne was visibly moved and expressed his regret that he was not able to announce that the experiments would begin in Great Britain on the morrow or for many morrows yet to come.

Tuberculous Disease in Cattle and in the Human Subject.

Several years ago Robert Koch startled the world by announcing that in tuberculin he had found practically a remedy for incipient tuberculous disease. At that time he had already achieved great distinction as a bacteriologist, and physicians everywhere, relying implicitly on his expressed convictions, vied with each other in obtaining and promptly employing the product, but it soon appeared evident that it was of no considerable curative efficiency save in the particular form of tuberculous disease known as lupus. Enthusiasm did not rise so high over his more recent *tuberculinum residuum* (T. R.), and now we hear little about it. It is no wonder, then, in view of the virtual failure of tuberculin, that when, before the recent British Congress of Tuberculosis, Koch belittled the precaution generally taken at the present day against the spread of tuberculous disease from cattle to man, there

was a very general dissent from his views. It will, we think, take more than a few experiments, coupled with rather sweeping deductions from common observation, to demonstrate to the medical profession that the supposed fact by which those precautions are warranted is no fact at all, for that is what Koch's contention will generally be interpreted as amounting to.

Professor Koch seems to have convinced himself that cattle are nearly, if not quite, insusceptible to infection with the micro-organism that occasions tuberculous disease in human beings. His experiments, not many in number, but extending over a considerable period of time and persistently and systematically carried on, it must be admitted, have failed to convey the human disease to cattle whether they consisted in feeding them with tuberculous sputum, in implanting it in a serous cavity, or in injecting it beneath the skin, whereas the same forms of inoculation with tuberculous material of bovine origin promptly resulted in infecting the animals with tuberculous disease. Great weight should undoubtedly be accorded to these experiments and to any opinion expressed by so acute an observer as Professor Koch, but in our opinion they cannot be held to be decisive by themselves alone. Opposed as they are to almost universal conviction, they cannot be accepted off-hand as final. Further experiments, varied perhaps in some ways that have not occurred to Professor Koch and that possibly will not at once suggest themselves to the minds of others, will have to be made before the question of the transmissibility of human tuberculous disease to cattle can be regarded as quite settled. Perhaps there are few qualified observers who would at the

present time declare without reserve that "tuberculosis of man and cattle is identical," as the United States Veterinary Medical Association did by resolution in 1896, but at least they are so nearly identical that each is capable of yielding a product known as tuberculin, and surely that is a dangerous approach to identity.

Furthermore—and this is a far more momentous matter for the human race—Koch argues against the transmissibility of bovine tuberculous disease to man. Deliberate experiments to decide this point are of course out of the question, but Koch thinks that the world is unconsciously performing experiments that suffice to sustain his view; that is to say, that beef, milk, and butter contaminated with living tubercle bacilli are constantly being ingested by many human beings, and yet primary tuberculous disease of the digestive tract is rare. To argue from such observations that the disease is not transmissible from cattle to man seems to us rather inconclusive. Theoretically, it may be granted, a tuberculous process at the initial point of contact of the germ with receptive tissue should be set up before an invasion of other parts took place, but we cannot regard it as proved that such is always the case. Who can say that in every instance of tuberculous disease of the meninges, of a joint or of any other structure not directly exposed to contact with germs a local tuberculous process is first set up at the point of their original lodgment? Reasoning from analogy, we may refer to M. Jullien's article, entitled *Two Clear Cases of Syphilis without a Chancre*, published in the *Medical Press* for July 3d and abstracted in this issue of the *Journal* under the head of *Miscellany*.

Finally, let us consider the action of

tuberculin. Are we to take it for granted that all the tuberculin that is capable of giving rise to the diagnostic reaction in cattle is of bovine origin? Apparently, that would have to be the case if human tuberculous infection were not transmissible to cattle. If it is the case, Koch's deductions will receive support in a substantial form, though it must still be borne in mind that, as a rule, infectious diseases which affect both man and the lower animals are not so readily transmitted from the one to the other as they are from one individual to another of the same species. All things considered, we must still urge upon sanitary officials the folly of discontinuing the precautions now resorted to until the needlessness of them is much more clearly shown than it has been thus far. As subjects of thought and further investigation, Professor Koch's propositions are quite in order, but that, it seems to us, is all that can be said of them at present. Even if they ultimately turn out to be well founded, the interests of stock-breeders and dairy-farmers will still require the extermination of tuberculous cattle.—*N. Y. Medical Journal*.

Review of Diseases for July, 1901.

NINETY-ONE COUNTIES REPORTING.

Ninety-four counties have Superintendents of Health.

Except in the case of the more contagious and dangerous diseases the Superintendent has, as a rule, to rely upon his own information alone, since few physicians can be induced to report cases of non-contagious diseases to him.

Where the number of cases is not given or the prevalence of a disease otherwise indicated, its mere presence in the county is to be understood as reported.

For the month of July the following

diseases have been reported from the counties named:

MEASLES.—Caldwell, a few cases; Currituck, a few; Duplin, 3; Graham, several; Henderson, 11; Lincoln, a few; Moore, a great many; New Hanover, 1; Onslow, 6; Orange; Pasquotank, 2; Perquimans, 12; Randolph, several; Richmond, many; Rockingham; Rowan, 6; Scotland, a few; Stanly; Yadkin, in nearly all parts—20 counties.

WHOOPIING-COUGH.—Burke, a few; Cabarrus, 87; Catawba, 18; Chatham, Cleveland, Cumberland, Currituck, a few each; Durham; Granville; Iredell, 6; Johnston; Martin, 20; Mecklenburg; Mitchell; Moore, a great many; New Hanover, 11; Onslow, 6; Orange; Perquimans, 4; Person, 2; Polk, 6; Randolph, a great many; Rockingham; Rowan, 12; Rutherford, a few; Surry, 4; Vance, a few; Wake, 3; Wayne, a few; Yancey, several—30 counties.

SCARLET FEVER.—Buncombe, 4; Cabarrus, 2; Davidson, 7; New Hanover, 3; Rockingham; Rowan, 3; Stanly, several; Watauga, a few—8 counties.

DIPHTHERIA.—Brunswick, 1; Cabarrus, 2; New Hanover, 7; Polk, 1.

TYPHOID FEVER.—Alamance, a few; Alexander, general; Ashe, 3; Beaufort, 4; Bertie, 1; Bladen; Brunswick, 5; Buncombe, 4; Burke, 30; Cabarrus, 12; Caldwell, 10; Caswell, 2; Catawba, 8; Chatham, many; Chowan, 10; Clay, 2; Cleveland, many; Columbus, 11; Craven, 14; Cumberland, 10; Currituck, a few; Davidson, several; Davie, 3; Duplin, 21; Durham; Edgecombe, 4; Forsyth, many; Franklin, in nearly all parts; Gaston, several; Granville, 5; Greene, 20; Guilford, many; Halifax, 12; Harnett, many; Haywood, 10; Henderson, 5; Hertford, 4; Iredell, in all parts; Johnston; Lenoir, 5; Lincoln, many; McDowell; Macon, 12; Madison, 4; Martin, 2; Montgomery, 5;

Moore, 10; Nash, 7; New Hanover, 32; Northampton, many; Onslow, 6; Pasquotank, 18; Pender, 12; Perquimans, 28; Person, 3; Pitt, in all parts; Polk, 14, and more; Randolph, 20; Richmond; Robeson, a great many; Rockingham; Rowan, a great many; Rutherford, a few; Sampson, many; Scotland, many; Stanly; Stokes, in most parts; Surry, 10; Union, 15 to 20; Vance, in all parts; Wake, 39; Warren, 43; Washington, 4; Watauga, 12; Wayne, several; Wilkes, in all parts; Yadkin, in nearly all parts; Yancey—77 counties.

MALARIAL FEVER.—Alamance, in all parts; Anson; Ashe, 3; Cabarrus; Bertie; Bladen; Brunswick; Carteret; Caswell; Catawba; Cherokee; Chowan; Craven; Currituck, general; Duplin; Franklin; Gaston, general; Greene, general; Halifax; Hyde, general; Lenoir; Lincoln; Montgomery; New Hanover; Onslow; Orange; Perquimans, in all parts; Robeson; Rowan; Sampson, general; Scotland, many; Surry; Wake; Warren, in all parts; Washington, general; Wayne—36 counties.

MALARIAL FEVER, PERNICIOUS.—Craven, 2; Hyde, 1; New Hanover, 1; Wake, 4; Washington, 1.

MALARIAL FEVER, HEMORRHAGIC.—New Hanover, 3; Onslow, 1; Perquimans, 1; Surry, 1.

DIARRHOEAL DISEASES, INCLUDING DYS-ENTERY.—Brunswick; Columbus; Currituck; Gaston; Graham; Harnett; Haywood; McDowell; Mitchell; Moore; Orange; Richmond; Sampson; Surry; Swain; Transylvania; Union; Wayne; Yadkin—19 counties.

PNEUMONIA.—Transylvania, 2; Wayne.

RHEUMATISM.—Transylvania, a few.

VARICELLA.—Caswell.

SMALL-POX.—Cleveland, 4; Davie, 1; Forsyth, 5, with one death; Gaston, 3; Guilford, 15, reduced to 1 on August 5;

Haywood, 1; Henderson, 15, under control at date of report August 1; Mecklenburg, 2; Orange, 13; Randolph, 23; Rockingham, 1; Stanly, 5; Wake, 1.

CHOLERA IN CHICKENS.—Chatham; Clay; Cleveland.

CHOLERA IN HOGS.—Bertie; Chowan; Columbus; Dare; Gates; Hertford; Martin; Northampton; Pender; Robeson—10 counties.

STAGGERS.—Superintendent of Health of Hyde county, Dr. E. H. Jones, writes: "Staggers and lung fever and some new disease among horses. Over one hundred have died during the past six weeks."

No diseases have been reported from Dare and Wilson.

No reports have been received from Alleghany, Jackson and Jones.

Summary of Mortuary Reports for July, 1901.

(TWENTY-FOUR TOWNS).

	White.	Col'd.	Total.
Aggregate population.....	85,020	52,860	137,880
Aggregate deaths.....	133	164	297
Representing temporary annual death rate per 1,000	18.8	37.2	25.8
<i>Causes of Death.</i>			
Typhoid Fever.....	17	9	26
Malarial fever	3	11	14
Diphtheria.....	2	1	3
Whooping-cough ..	2	9	11
Pneumonia.....	3	1	4
Consumption.....	10	22	32
Brain diseases.....	2	2	4
Heart diseases.....	8	6	14
Neurotic diseases...	0	3	3
Diarrhoeal diseases	27	29	56
All other diseases..	55	69	124
Accident	4	1	5
Violence	0	1	1
	133	164	297
Deaths under five years.....	53	71	124
Still-born.....	8	13	21

Mortuary Report for July, 1901.

TOWNS AND REPORTERS.	RACES.	POPULA- TION.		TEMPORARY ANNUAL DEATH RATE PER 1,000.																TOTAL DEATHS.					
		By Races.	Total.	By Races.	Total.	Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrhoeal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	By Races.	By Towns.	Deaths under five years.	Still-born.
Asheville	W.	9,700		21.0		1						1	1	4	1		4	5	3		17	26	7		
Dr. C. V. Reynolds.	C.	5,000	14,700	21.6	21.2	1							2				2	3	1				3	6	
Charlotte	W.	12,000		18.0		2						1	3				2	12			18	52	4	2	
Dr. F. O. Hawley.	C.	6,100	18,100	66.9	34.4	2		1	1	3			2		1		7	17			34	17	3		
Durham	W.	10,000		19.2		4				1			2				4	5			16	33	8		
Dr. N. M. Johnson.	C.	5,000	15,000	40.8	26.4	2				4		1	1		1		1	7			17	10			
Fayetteville	W.	2,800		17.1		2									1			1			4	11	5		
Dr. John D. MacRae.	C.	1,900	4,700	44.2	28.1			2		1							2	2			7	1			
Goldsboro	W.	3,400		21.2								1					2	3			6	16	5		
Geo. E. Hood, Mayor.	C.	2,500	5,900	48.0	32.7								3	1		1	1	4			10	3	1		
Henderson	W.	2,100		17.1						1								2			3	7	2		
Dr. F. R. Harris.	C.	1,700	3,800	28.2	28.2	1										1	2								
Laurinburg	W.	900		0.0														1			0	1	1		
Dr. A. W. Hamer.	C.	600	1,500	20.0	8.0																1				
Lenoir	W.	1,200		10.0														1			1	2	1		
Dr. A. A. Kent.	C.	300	1,500	40.0	16.0													1			1				
Marion	W.	800		30.0														2			2	2			
Dr. B. A. Cheek.	C.	350	1,150	0.0	20.8																0				
Monroe	W.	1,850		6.5													1				0	1			
Dr. J. M. Blair.	C.	600	2,450	0.0	4.9																				
Oxford	W.	1,200		0.0																	0	2	1		
Dr. S. D. Booth.	C.	900	2,100	26.7	11.4													1	1						
Raleigh	W.	8,000		13.5		1									3		3	2			9	26	4	1	
T. P. Sale, Clerk B. H.	C.	7,000	15,000	29.1	20.8								2				1	14			17	4	2		
Reidsville	W.	2,000		24.0									1					3			4	9		1	
Jas. T. Smith, Cy. Cl.	C.	1,260	3,260	47.6	33.1									3				2			5				
Rockingham	W.	1,500		40.0		1											3	1			5	5	2	2	
Dr. Wm. P. S. Webb.	C.	500	2,000	0.0	30.0																0				
Rocky Mount	W.	1,850		13.0											1			1			0	2			
Dr. G. L. Wimberley, Jr.	C.	1,100	2,950	0.0	8.1																				
Salem	W.	3,300		21.8											1			5			6	7	3	1	
J. A. Vance, Mayor.	C.	350	3,650	34.3	23.0													1			1				
Salisbury	W.	4,300		19.5									1	1			1	3	1		7	11	1		
Dr. W. W. McKenzie.	C.	2,000	6,300	24.0	20.9	1							1				2				4	1	2		
Scotland Neck	W.	1,000		48.0		3											1				4	5	1		
Dr. J. P. Wimberley.	C.	500	1,500	24.0	40.0								1								1				
Smithfield	W.	620		0.0																	0	1			
J. C. Bingham, Mayor.	C.	450	1,070	26.7	11.2			1													1				
Southport	W.	900		0.0																	0	2			
Dr. D. I. Watson.	C.	500	1,400	48.0	17.1								1	1											
Tarboro	W.	2,000		0.0																	0	0			
Dr. L. L. Staton.	C.	500	2,500	0.0	0.0																				
Washington	W.	2,900		12.4		1											2				3	12	2		
Dr. Jno. G. Blount.	C.	2,000	4,900	54.0	29.4		2						1				4	2			9	7			
Weldon	W.	700		0.0																	0	3	1		
J. T. Gooch, Mayor.	C.	750	1,450	48.0	24.8			1					1			1					3				
Wilmington	W.	10,000		30.0		4		3	2			2	1				4	9			25	61	10	1	
Dr. Chas. T. Harper.	C.	11,000	21,000	39.3	34.8	2		4	1			4	1	3	1		4	15			1	36	14		

N. B.—The reporters for the cities and towns printed in **Black Type** have signed this certificate: "I hereby certify that this report gives the whole number of deaths occurring within the corporate limits during the above month." The total populations are taken from the census report for 1900, but the division into races is estimated, as those figures have not been given out.

County Superintendents of Health.

Alamance	Dr. H. R. Moore.	Jones.....	Dr. S. E. Koonce.
Alexander	Dr. C. J. Carson.	Lenoir	Dr. C. L. Pridgen.
Alleghany	Dr. B. C. Waddell.	Lincoln	Dr. T. F. Costner.
Anson	Dr. J. H. Bennett.	McDowell	Dr. B. A. Cheek.
Ashe.....	Dr. J. W. Colvard.	Macon	Dr. F. L. Siler.
Beaufort	Dr. Jno. G. Blount.	Madison	Dr. Jas. K. Hardwicke.
Bertie	Dr. H. V. Dunstan.	Martin.....	Dr. W. H. Harrell.
Bladen.....	Dr. Newton Robinson.	Mecklenburg.....	Dr. C. S. McLaughlin.
Brunswick	Dr. J. A. McNeill.	Mitchell.....	Dr. V. R. Butt.
Buncombe	Dr. E. B. Glenn.	Montgomery	Dr. M. P. Blair.
Burke.....	Dr. J. L. Laxton.	Moore.....	Dr. Gilbert McLeod.
Cabarrus.....	Dr. R. S. Young.	Nash	Dr. J. P. Battle.
Caldwell	Dr. A. A. Kent.	New Hanover	Dr. W. D. McMillan.
Camden.....		Northampton.....	Dr. H. W. Lewis.
Carteret.....	Dr. F. M. Clark.	Onslow.....	Dr. E. L. Cox.
Caswell	Dr. S. A. Malloy.	Orange.....	Dr. D. C. Parris.
Catawba	Dr. Geo. H. West.	Pamlico.....	
Chatham.....	Dr. H. T. Chapin	Pasquotank	Dr. H. T. Aydlett.
Cherokee.....	Dr. J. W. Patton	Pender.....	Dr. J. R. Thomson.
Chowan.....	Dr. T. J. Hoskins.	Perquimans	Dr. C. C. Winslow.
Clay	Dr. J. O. Nichols.	Person	Dr. J. A. Wise.
Cleveland	Dr. B. H. Palmer.	Pitt.....	Dr. C. O'H. Laughing- house.
Columbus.....	Dr. I. Jackson.	Polk	Dr. Earle Grady.
Craven.....	Dr. W. H. Street.	Randolph	Dr. S. A. Henley.
Cumberland.....	Dr. Jno. D. McRae.	Richmond.....	Dr. Wm. P. Webb.
Currituck	Dr. H. M. Shaw.	Robeson.....	Dr. H. T. Pope.
Dare	Dr. W. B. Fearing.	Rockingham	Dr. Sam Ellington.
Davidson	Dr. Joel Hill.	Rowan	Dr. W. L. Crump.
Davie	Dr. James McGuire.	Rutherford.....	Dr. T. B. Twitty.
Duplin	Dr. O. F. Smith.	Sampson	Dr. R. E. Lee.
Durham	Dr. N. M. Johnson.	Scotland	Dr. A. W. Hamer.
Edgecombe	Dr. L. L. Staton.	Stanly.....	Dr. V. A. Whitley.
Forsyth.....	Dr. John Bynum.	Stokes	Dr. W. V. McCanless.
Franklin	Dr. E. S. Foster.	Surry	Dr. John R. Woltz.
Gaston.....	Dr. J. H. Jenkins.	Swain.....	Dr. J. A. Cooper.
Gates.....	Dr. W. O. P. Lee.	Sylvania	Dr. C. W. Hunt.
Graham	Dr. R. J. Orr.	Tyrrell.....	
Granville	Dr. S. D. Booth.	Union	Dr. J. E. Ashcraft.
Greene.....	Dr. Joseph E. Grimsley.	Vance.....	Dr. Goode Cheatham,
Guilford.....	Dr. Edmund Harrison.	Wake.....	Dr. J. J. L. McCullers.
Halifax	Dr. I. E. Green.	Warren.....	Dr. A. S. Pendleton.
Harnett.....	Dr. O. L. Denning.	Washington	Dr. W. H. Ward.
Haywood	Dr. S. B. Medford.	Watauga.....	Dr. T. C. Blackburn.
Henderson	Dr. J. G. Waldrop.	Wayne.....	Dr. Williams Spicer.
Hertford	Dr. John W. Tayloe.	Wilkes.....	Dr. J. M. Turner.
Hyde.....	Dr. E. H. Jones.	Wilson.....	Dr. W. S. Anderson.
Iredell	Dr. Henry F. Long.	Yadkin.....	Dr. S. L. Russell.
Jackson.....	Dr. Wm. Self.	Yancey	Dr. J. L. Ray.
Johnston	Dr. L. D. Wharton.		

BULLETIN

OF THE

North Carolina Board of Health.

Published Monthly at the Office of the Secretary of the Board, Raleigh, N. C.

GEO. G. THOMAS, M. D., *Pres.*, Wilmington.
S. WESTRAY BATTLE, M. D....Asheville.
HENRY W. LEWIS, M. D.....Jackson.
J. L. NICHOLSON, M. D.....Richlands.

W. P. IVEY, M. D.....Lenoir.
FRANCIS DUFFY, M. D.....New Bern.
W. H. WHITEHEAD, M. D.....Rocky Mt.
J. L. LUDLOW, C. E.....Winston.

RICHARD H. LEWIS, M. D., *Secretary and Treasurer*, Raleigh.

VOL. XVI.

SEPTEMBER, 1901.

No. 6.

The Recent Meetings of the National Conference of State and Provincial Boards of Health at Niagara Falls and of the American Public Health Association at Buffalo.

We have just returned from meetings of the two associations named above—the two most important annual gatherings in the interests of the public health.

The National Conference is what its name implies, a conference of the health officials, secretaries and members of State and Provincial Boards of this country and Canada. Its membership, therefore, is made up of the men who do, or largely direct, the practical sanitary work of the two countries. It is an earnest, hard-working body, sometimes rather too oblivious, we have thought, of the *desipere in loco* idea. The principal business of the recent meeting was the very thorough discussion and careful amendment of certain "Resolutions relating to 'Domes-

tic Quarantine or Isolation in the Restriction of Communicable Diseases,' " prepared for the meeting by the Programme Committee. Owing to the recent discoveries in the method of transmission of yellow fever, action on that disease was postponed and the matter referred to a committee of five, one each from the Army, Navy, Marine Hospital Service, New Orleans and Savannah, which is to report at the next meeting. After adoption they were referred to the same committee for better arrangement. That, however, will not improve their actual quality, and so we will not wait but print them below, commending them to the careful consideration of our medical readers especially.

In view of the existence of scarlet fever in a good many counties, it may be worth while to mention the fact which was brought out in the discussion of the resolution bearing on that disease that des-

quamation from the hands and feet continues longer than from other parts of the body and that it is advisable to disinfect the stockings for a week or two after the patient is discharged from quarantine.

The American Public Health Association, which is composed of men of standing in all callings, professional sanitarians, engineers, ministers, lawyers, merchants, representatives from the Army, Navy, Marine Hospital Service, and others from the United States, Canada and Mexico, is the largest and most influential health organization in America, and perhaps in the world. A large number of papers by men of authority on the subjects discussed are read at every session. The most interesting and valuable communication presented during our stay, which did not last to the end of the meeting, owing to the adjournment over Thursday as a mark of respect to our universally lamented President, was the report by Surgeon Walter Reid of the Army, on the transmission of yellow fever by mosquitoes. He made out his case, but notwithstanding the general opinion, as far as we could gather, seemed to be that it would be unwise to relax the usual precautions heretofore observed until time and further experience had more fully demonstrated the truth of the brilliant observations made on this line. This feeling was particularly strong among the members from New Orleans who had had much experience with the disease.

Koch's recently expressed views on the transmissibility of bovine tuberculosis to man did not meet with anything like general approval.

A report on the burning question of the Army Canteen was read and discussed and a resolution requesting the Government to re-instate it was adopted

unanimously, although we heard one dissenting voice after the decision of the chair was announced. The following statistics cited in the report are interesting and significant:

"From the figures of official reports, which can be readily verified, and comparing the seven years, 1885-1891, before the canteen system was fully established, with the six years, 1892-1897, after the system was fully established throughout the army:

"The amount of drunkenness, as expressed in admissions to the hospital for alcoholism, was decreased 23.6 per cent.

"Delirium tremens decreased by 31.3 per cent. During the same period insanity decreased by 31.7 per cent., and the days of service lost to the Government from insanity decreased 40.9 per cent.

"The number of soldiers making deposits of savings with army paymasters increased by 13.3 per cent.

"Desertions diminished, for the same period, from an annual average of 9.19 per cent. to 4.53 per cent. This decrease of desertion for the two years prior to the war with Spain, resulted in a money-saving to the Government of more than two million dollars.

"For the seven-year pre-canteen period, the actual number of convictions by court martial for drunkenness and causes arising therefrom, amounted to an average of 372.5 per annum, while the six years after the canteen was thoroughly established, the annual average was 100.6."

We feel that it was good for us to have been at these meetings. We learned something and our interest and zeal were quickened.

RESOLUTIONS RELATING TO "DOMESTIC QUARANTINE OR ISOLATION IN THE RESTRICTION OF COMMUNICABLE DISEASES."

(Adopted by the National Conference of State and Provincial Boards of Health, Niagara Falls, September 13-14).

SMALL-POX AND SCARLET FEVER.

Resolved, That the isolation of any person afflicted with small-pox (varioid) or scarlet fever (scarlatina or scarlet rash), and of the nurse or nurses attending upon such person, shall be absolute. That such isolation shall continue for a period of not less than four weeks from the first appearance of the eruption, and as much longer as may be necessary to secure complete desquamation and a healthy condition of the throat and nose, the necessary period to be determined by the health officer in charge or his assistant.

DIPHTHERIA OR MEMBRANOUS CROUP.

Resolved, That the isolation of any person affected with diphtheria or so-called laryngeal or membranous croup, and of the nurse or nurses attendant upon such person shall be absolute, and shall be governed by the following regulations:

1. In all cases of sore throat which may necessarily be suspected to be diphtheria, a report should forthwith be made by the attending physician of such fact to the health officer.

2. Specimens should be taken at once by the health officer, or attending physician, from the throat, or from the nose and throat of such suspected case and sent to an approved bacteriological laboratory for examination.

3. During the time between the sending of the specimen and the receipt of the report, strict isolation of the patient should be maintained.

4. Whenever the presence of the bacillus diphtheriae is in any manner re-

ported by an approved bacteriologist, the house should forthwith be quarantined and a plainly printed notice thereof, including the name of the disease, should be posted in a conspicuous place thereon and guards stationed if necessary.

5. It is the duty of the attending physician to report to the local health officer the names and addresses of those who have been exposed to diphtheria.

6. It is the duty of the attending physician or local health officer to take and forward to the laboratory of the State Board of Health, or other approved bacteriological laboratory, specimens from the throats of those exposed to diphtheria, and, pending a report thereon, to see that isolation is maintained.

7. It is the duty of the health officer to place in quarantine those who, after exposure to clinical diphtheria, are reported from the laboratory to be infected with bacillus diphtheriae.

8. After proper disinfection quarantine shall be removed from those houses in which diphtheria has been diagnosed when synchronous cultures taken from the noses and throats of all persons quarantined have been pronounced to be free of diphtheria bacilli by a bacteriologist approved by the State Board of Health.

9. After the laboratory diagnosis of diphtheria has been given, it shall be the duty of the health officer to see that specimens from both nose and throat of the patient are forwarded by himself or the attending physician to a laboratory, approved by the State Board of Health, at least once a week after clinical symptoms have subsided, until negative reports for both nose and throat are obtained.

10. Those who have been brought in contact with diphtheria patients, and in whose throats diphtheria bacilli have

been found, may be released from quarantine when both nose and throat cultures, on examination by a bacteriologist, approved by the State Board of Health, no longer show the presence of diphtheria bacilli.

11. When the diphtheria bacillus exists for a period of more than three weeks after the disappearance of all throat symptoms, the bacillus should be isolated in pure culture and its virulence tested upon guinea pigs, at the request of the health officer. If the bacillus is not found virulent, quarantine may be released. As these experiments will take from five to ten days, later specimens ought to be sent to the laboratory, since they may show the absence of all diphtheria bacilli before complete determination.

12. All specimens sent to the laboratory should be reported upon, in writing, by the bacteriologist upon the morning following their receipt: *Provided, however*, that such report should be made by telegram, upon request, at the expense of the person making the request.

In country districts, where it is not possible to use the laboratory findings as a means of regulating quarantine, those suffering from diphtheria or associated with a diphtheria patient, shall be quarantined for a period of not less than four weeks.

TYPHUS FEVER, CHOLERA, PLAGUE, ETC.

Resolved, That the isolation of any person affected with typhus fever, cholera, plague, and of the nurse or nurses attendant upon such person or persons, shall be absolute until such time as the health officer in charge shall pronounce the danger from infection as having passed.

Resolved, That in all cases of isolation because of the existence of a directly communicable disease, such isolation be continued until thorough disinfection has

been made of the patient or patients, of the nurse or nurses, of the room or rooms in which such persons have been isolated, and of all clothing, furniture, bedding, etc., that have been in such rooms.

Resolved, That all susceptible individuals who have been exposed to small-pox, scarlet fever, diphtheria, typhus fever and plague should be kept in isolation until a thorough disinfection can be carried out of their person and clothing; and that they should be excluded from school, or other place where people congregate, until the recognized period of incubation for the individual disease to which they have been exposed shall have passed.

That all such exposed persons be kept in isolation or under observation, as the circumstances may require, until the period of incubation for the individual disease to which exposure has occurred has passed.

It is understood that the time isolation will not apply in cases when the patient is removed from a house by death or otherwise. In such cases the persons or rooms under isolation should be disinfected and isolation may discontinue, the exposed persons being still kept under observation during the recognized period of incubation.

MEASLES, SMALL-POX, DIPHTHERIA AND SCARLET FEVER IN RELATION TO SCHOOLS.

Resolved, That children living in a house infected with measles, small-pox, diphtheria and scarlet fever should be excluded from school, public or private: *Provided, however*, that such restrictions shall not apply to children removed from an infected house a sufficiently long time to cover the period of incubation for the disease.

TYPHOID FEVER.

Resolved, That all cases of typhoid fever should be reported to local health officers, not for the purpose of establishing isolation of the home, but in order that its origin may be investigated that an educational crusade may be systematically carried out against the disease.

TUBERCULOSIS.

Resolved, That all cases of tuberculosis should be reported to local health officers, not for the purpose of establishing isolation of the home, but in order that its origin may be investigated that an educational crusade may be systematically carried out against the disease.

LEPROSY.

Resolved, That all cases of leprosy should be reported to the State health officials.

ALL COMMUNICABLE DISEASES.

Resolved, That the responsibility for the release of isolation must in all cases rest upon the sanitary official.

Resolved, That disinfection of the exposed persons, and of rooms, furniture, bedding, clothing, carpets, hangings, etc., where the infected patients have had residence, should in all cases be required before isolation or other restrictions are removed.

Resolved, That in all cases where disinfection of a room and its contents is required after the death or recovery of any person ill with an infectious disease, the entire responsibility should rest upon the local board of health, or health officer, and the expense upon the municipality in which the disease occurs.

METHOD OF DISINFECTION.

Resolved, That during the progress of an infectious disease disinfection shall be carried out as follows:

For diphtheria and tuberculosis, the destruction or disinfection of all cloths, clothing or other articles that have been soiled by the discharges from the nose and mouth; the thorough disinfection of the sick room and its contents at conveniently frequent intervals if the disease is tuberculosis.

For cholera, typhoid fever, dysentery and intestinal tuberculosis, a thorough disinfection of all excreta from the patient.

For typhus fever, plague, small-pox and scarlet fever, the destruction or thorough disinfection of all cloths, personal or bed clothing, etc., that have been used by the patient.

 Review of Diseases for August, 1901.

NINETY-ONE COUNTIES REPORTING.

Ninety-four counties have Superintendents of Health.

Except in the case of the more contagious and dangerous diseases the Superintendent has, as a rule, to rely upon his own information alone, since few physicians can be induced to report cases of non-contagious diseases to him.

Where the number of cases is not given or the prevalence of a disease otherwise indicated, its mere presence in the county is to be understood as reported.

For the month of August the following diseases have been reported from the counties named:

MEASLES.—Cleveland, a few cases; Granville, 5; Henderson, 13; McDowell; Macon, several; Orange; Randolph, several; Watauga, a few—8 counties.

WHOOPING-COUGH.—Cabarrus, 31; Cleveland, several; Cumberland, several; Dare, in all parts; Durham, several; Martin, 20; Mecklenburg; Moore, several; New Han-

over, 3; Onslow, 5; Orange: Perquimans, 2; Rockingham; Rutherford, a few; Scotland, 2; Vance, several; Wake, 18—17 counties.

SCARLET FEVER.—Alexander, many cases; Brunswick, 4; Buncombe, 16; Cabarrus, 5; Caldwell, 1; Cherokee, 50 or 60 cases, with 8 deaths; Clay, several; Davidson, 1; Durham, 50—"The peculiarity of this scarlet fever is that the cases have been found at remote distances from each other. The disease has not spread from any one center. It has been very mild as a rule"; Franklin, 3; Greene, 1; Haywood, 1; Henderson, 1; Martin, 3; Mecklenburg, 6; New Hanover, 2; Orange, 2; Rockingham; Stanly; Wake, 6; Warren, 4; Watanga, several—22 counties.

MALARIAL FEVER.—Alamance, in all parts; Bertie, in all parts; Bladen; Brunswick; Carteret; Caswell; Catawba; Chatham; Chowan, in all parts; Columbus; Craven, mild, in all parts; Cumberland; Currituck, in all parts; Duplin; Franklin, general; Gaston; Gates, in all parts; Granville; Greene, in all parts; Guilford; Halifax, general; Harnett; Hertford; Hyde, in all parts; Johnston, in all parts; Jones; Lenoir; Lincoln, many; Martin, in all parts; Mitchell; Montgomery; Northampton; Onslow; Orange, in all parts; Pasquotank; Pender, in many parts; Perquimans, in all parts; Person; Randolph, in all parts; Robeson; Sampson, in nearly all parts; Scotland, in all parts; Vance; Warren, in many parts; Washington, in all parts; Yadkin, in all parts—46 counties.

MALARIAL FEVER, PERNICIOUS.—Columbus, 2; Harnett, a few; Hyde, 1; Randolph, 2; Vance, 3; Warren, 2—6 counties.

MALARIAL FEVER, HEMORRHAGIC.—

Hertford, 2; Hyde, 1; Onslow, 1; Perquimans, 1.

DIARRHOEAL DISEASES.—Currituck; Harnett; Onslow; Orange; Richmond; Sampson; Transylvania—7 counties.

MUMPS.—Caldwell.

RÖTHELN.—Polk.

SMALL-POX.—Cabarrus, 12; Cumberland—Dr. MacRae reports: "There has been small-pox in five families just south of Fayetteville; 15 cases, all unvaccinated, all mild but two. Of eight or ten vaccinated persons in these families all escaped. These cases were concealed till most of them were well." Davie, 3; Granville, 4. Dr. Booth found it necessary to establish a shot-gun quarantine in one place. An unruly and defiant negro man was hit in the legs with buck shot, without serious injury, with the applause of all the neighbors. Haywood, 3; Henderson, 15; Mecklenburg, 7; Randolph, 5; Stanly, 1; Vance, 1; Wayne, 2 or 3. Dr. W. S. Anderson, of Wilson, says: "The same eruptive disease has prevailed in nearly all parts of the county." He is still assured it is varicella.

CHOLERA IN CHICKENS.—Ashe and Chatham.

CHOLERA IN HOGS.—Caswell, Columbus, Gates, Pender, Perquimans, Randolph, Richmond, Robeson.

RABIES IN DOGS.—Lenoir, 7 or 8 cases.

STAGGERS IN HORSES.—Jones, New Hanover, Perquimans and Washington.

A fatal disease, diagnosed as staggers by our State Veterinarian, has killed many horses in Chowan, Dare, Hertford and Hyde.

DIPHTHERIA.—Brunswick, 5; Cabarrus, 1; Cleveland, several; Forsyth, several;

Mecklenburg, 4; New Hanover, 1; Polk, 1; Wake, 1; Wilkes, 2—9 counties.

TYPHOID FEVER.—Alamance, 9; Alexander, 25; Ashe, 12; Beaufort, 1; Bertie, 13; Brunswick, 6; Buncombe, 3; Burke, 8; Cabarrus, 12; Caldwell, 15; Catawba, 11; Chatham, many; Chowan, 15; Clay, 4; Cleveland, several; Columbus, many; Craven, 4; Cumberland, several; Currituck, many; Duplin, 2; Durham, a few; Edgecombe, 3; Gaston; Granville, 3; Greene, 25; Guilford, 4; Halifax, many; Harnett, many; Haywood, 20; Hertford, 2; Iredell, in all parts; Jackson, 12; Jones, several; Lincoln, a few; McDowell; Macon, 20; Madison, 20; Mecklenburg; Montgomery, 6; Moore, a few; Nash, 9; New Hanover, 4; Northampton, in all parts; Onslow, 1; Orange, 2; Pasquotank, 7; Pender, 5; Perquimans, 6; Person, 3; Polk, 14; Randolph, 20; Richmond, a great many; Robeson, a great many; Rockingham, in all parts; Rutherford, a few; Sampson, many; Scotland, 28; Stanly, in all parts; Stokes, 15; Surry, 12; Swain, 2; Transylvania, 1; Union, several; Vance, in all parts; Wake, 37; Warren, 11; Watauga, several; Wayne, several; Wilkes, 10; Wilson, several; Yadkin, in all parts; Yancey, a few—72 counties.

An undiagnosed disease has prevailed among cattle in Bertie.

No diseases reported from Anson and Graham.

No reports received from Alleghany, Pitt and Rowan.

Summary of Mortuary Reports for August, 1901.

(TWENTY-FIVE TOWNS).

Aggregate popula- tion.....	White. 86,120	Col'd. 55,880	Total. 141,970
Aggregate deaths...	115	135	248
Representing tem- porary annual death rate per 1,000	15.7	29.0	20.9
<i>Causes of Death.</i>			
Typhoid Fever.....	11	8	19
Scarlet Fever.....	3	0	3
Malarial fever	5	12	17
Diphtheria.....	1	0	1
Whooping-cough ..	3	4	7
Pneumonia.....	2	1	3
Consumption	11	12	23
Brain diseases.....	5	4	9
Heart diseases.....	8	10	18
Neurotic diseases...	3	2	5
Diarrhoeal diseases	18	20	38
All other diseases..	40	54	94
Accident	1	6	7
Suicide	1	0	1
Violence	1	2	3
	113	135	248
Deaths under five years.....	48	47	95
Still-born.....	10	10	20

Mortuary Report for August, 1901.

TOWNS AND REPORTERS.	RACES.	POPULATION.		TEMPORARY ANNUAL DEATH RATE PER 1,000.																	TOTAL DEATHS. Deaths under five years.				
		By Races.	Total.	By Races.	Total.	Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrheal Diseases.	All Other Diseases.	Accident.	Suicide.		Violence.			
Asheville	W.	10,000	14,800	18.0	26.7	1	1	...	...	...	...	1	2	4	...	4	1	...	...	1	15	33	8	2
Dr. C. V. Reynolds.	C.	4,800	45.0	3	...	1	2	18	33	3	2
Charlotte	W.	11,000	18,200	20.4	24.4	1	...	1	1	2	...	1	...	...	...	...	2	9	...	...	17	37	13	3
Dr. F. O. Hawley.	C.	7,200	33.3	...	...	...	...	...	1	...	...	...	1	...	...	4	11	...	...	...	29	37	13	...
Durham	W.	10,000	15,000	7.2	14.4	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	6	18	...	1
Dr. N. M. Johnson.	C.	5,000	28.8	...	...	...	...	...	...	1	...	1	1	...	...	...	7	...	...	...	12	18	...	...
Fayetteville	W.	2,500	4,800	4.8	15.0	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	6	...	1
Dr. John D. MacRae.	C.	2,300	26.1	...	...	...	...	...	1	...	...	...	2	...	...	...	1	...	...	...	5	6	...	...
Goldsboro	W.	3,400	6,000	24.7	22.0	2	...	1	...	...	...	2	...	...	...	...	2	...	...	...	7	11	2	1
Geo. E. Hood, Mayor.	C.	2,600	18.5	...	...	1	...	...	...	...	...	...	...	...	...	...	2	1	...	...	4	1	...	...
Henderson	W.	2,300	3,800	5.2	12.6	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1
Dr. F. R. Harris.	C.	1,500	24.0	...	...	...	...	...	...	...	...	1	...	...	...	...	2	...	...	...	3	4	...	...
Laurinburg	W.	900	1,500	40.0	40.0	...	...	...	...	...	...	...	1	...	...	1	1	...	1	...	3	5	...	2
Dr. A. W. Hamer.	C.	600	40.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lenoir	W.	1,200	1,500	20.0	32.0	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	2	4	1	...
Dr. A. A. Kent.	C.	300	80.0	...	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	2	4	1	...
Marion	W.	800	1,150	0.0	20.9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	2	...	...
Dr. B. A. Cheek.	C.	350	68.6	...	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...	2	2	...	...
Monroe	W.	1,850	2,450	13.0	9.8	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	2	2	...	...
Dr. J. M. Blair.	C.	600	0.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	2	...	...
Oxford	W.	1,200	2,100	30.0	22.8	...	...	...	...	...	...	...	...	...	...	...	1	2	...	...	3	4	1	...
Dr. S. D. Booth.	C.	900	13.3	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...
Raleigh	W.	8,000	13,800	15.0	17.4	...	...	1	...	...	...	...	2	1	...	...	4	2	...	...	10	20	7	2
T. P. Sale, Clerk B. H.	C.	5,800	20.7	...	...	...	...	...	...	1	...	...	...	2	...	...	1	6	...	...	10	20	5	3
Reidsville	W.	2,900	4,200	12.4	17.1	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	3	6	2	1
Jas. T. Smith, Cy. Cl.	C.	1,300	27.7	...	...	...	2	...	...	...	...	1	...	...	...	...	...	...	...	...	3	...	...	...
Rockingham	W.	1,500	2,000	40.0	42.0	2	...	...	...	...	...	...	1	...	1	...	1	...	...	...	5	7	1	...
Dr. Wm. P. S. Webb.	C.	500	48.0	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	7	1	...
Rocky Mount	W.	1,500	3,100	24.0	11.6	1	...	...	...	...	...	...	...	...	...	...	1	1	...	...	3	3	...	...
Dr. G. L. Wimberley, Jr	C.	1,600	0.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Salem	W.	3,200	3,700	11.2	9.7	...	...	...	...	...	...	...	2	...	1	...	...	...	...	...	3	3	1	...
J. A. Vance, Mayor.	C.	500	0.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	3	...	...
Salisbury	W.	3,900	6,400	18.5	16.9	1	...	...	1	...	...	...	...	...	...	...	4	...	...	...	6	9	1	...
Dr. W. W. McKenzie.	C.	2,500	14.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	3	...	...	...
Scotland Neck	W.	1,000	1,500	48.0	32.0	2	...	...	...	...	...	1	...	...	...	...	...	...	...	...	4	4	...	...
Dr. J. P. Wimberley.	C.	500	0.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Smithfield	W.	620	1,070	38.7	22.4	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	2	2	2	...
J. C. Bingham, Mayor.	C.	450	0.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	...	...	...
Southport	W.	900	1,400	26.7	17.1	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	2	4	...	...
Dr. D. I. Watson.	C.	500	48.0	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	2	...	...	...
Tarboro	W.	2,000	2,500	0.0	0.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	0	...	...
Dr. L. L. Staton.	C.	500	0.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	...	...	...
Washington	W.	2,300	4,900	20.8	28.6	1	...	...	...	...	...	...	...	...	...	...	3	...	...	...	4	12	3	...
Dr. Jno. G. Blount.	C.	2,600	36.9	...	...	...	2	...	...	...	...	2	...	...	...	...	4	...	...	...	8	13	6	1
Weldon	W.	700	1,450	0.0	8.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	1	...	...
J. T. Gooch, Mayor.	C.	750	16.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Wilmington	W.	10,600	21,100	13.6	26.2	...	...	1	...	...	...	...	3	1	2	1	1	3	...	...	12	46	4	...
Dr. Chas. T. Harper.	C.	10,500	38.8	...	...	...	...	4	...	...	...	...	3	2	4	2	6	13	...	...	34	46	14	4
Wilson	W.	1,850	3,550	13.0	20.3	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...	2	6	1	...
Dr. W. S. Anderson.	C.	1,700	28.2	...	...	...	1	...	...	...	...	...	...	...	...	...	1	2	...	...	4	...	...	...

N. B.—The reporters for the cities and towns printed in **Black Type** have signed this certificate: "I hereby certify that this report gives the *whole* number of deaths occurring within the corporate limits during the above month." The total populations are taken from the census report for 1900, but the division into races is estimated, as those figures have not been given out.

*This is the estimate of the reporter since the extension of the city limits.

County Superintendents of Health.

Alamance	Dr. H. R. Moore.	Jones.....	Dr. S. E. Koonce.
Alexander	Dr. C. J. Carson.	Lenoir	Dr. C. L. Pridgen.
Alleghany	Dr. B. C. Waddell.	Lincoln	Dr. T. F. Costner.
Anson	Dr. J. H. Bennett.	McDowell.....	Dr. B. A. Cheek.
Ashe.....	Dr. J. W. Colvard.	Macon	Dr. F. L. Siler.
Beaufort	Dr. Jno. G. Blount.	Madison	Dr. Jas. K. Hardwicke.
Bertie	Dr. H. V. Dunstan.	Martin.....	Dr. W. H. Harrell.
Bladen.....	Dr. Newton Robinson.	Mecklenburg.....	Dr. C. S. McLaughlin.
Brunswick	Dr. J. A. McNeill.	Mitchell.....	Dr. V. R. Butt.
Buncombe	Dr. E. B. Glenn.	Montgomery	Dr. M. P. Blair.
Burke.....	Dr. J. L. Laxton.	Moore.....	Dr. Gilbert McLeod.
Cabarrus.....	Dr. R. S. Young.	Nash	Dr. J. P. Battle.
Caldwell	Dr. A. A. Kent.	New Hanover	Dr. W. D. McMillan.
Camden.....		Northampton.....	Dr. H. W. Lewis.
Carteret	Dr. F. M. Clark.	Onslow.....	Dr. E. L. Cox.
Caswell	Dr. S. A. Malloy.	Orange.....	Dr. D. C. Parris.
Catawba	Dr. Geo. H. West.	Pamlico.....	
Chatham.....	Dr. H. T. Chapin.	Pasquotank	Dr. H. T. Aydlett.
Cherokee.....	Dr. J. W. Patton.	Pender.....	Dr. J. R. Thomson.
Chowan.....	Dr. T. J. Hoskins.	Perquimans.....	Dr. C. C. Winslow.
Clay	Dr. J. O. Nichols.	Person	Dr. J. A. Wise.
Cleveland	Dr. B. H. Palmer.	Pitt.....	Dr. C. O'H. Laughing-
Columbus.....	Dr. I. Jackson.		house.
Craven.....	Dr. N. H. Street.	Polk	Dr. Earle Grady.
Cumberland.....	Dr. Jno. D. McRae.	Randolph	Dr. S. A. Henley.
Currituck	Dr. H. M. Shaw.	Richmond.....	Dr. Wm. P. Webb.
Dare	Dr. W. B. Fearing.	Robeson.....	Dr. H. T. Pope.
Davidson	Dr. Joel Hill.	Rockingham	Dr. Sam Ellington.
Davie	Dr. James McGuire.	Rowan.....	Dr. W. L. Crump.
Duplin	Dr. O. F. Smith.	Rutherford.....	Dr. T. B. Twitty.
Durham	Dr. N. M. Johnson.	Sampson	Dr. R. E. Lee.
Edgecombe	Dr. L. L. Staton.	Scotland	Dr. A. W. Hamer.
Forsyth.....	Dr. John Bynum.	Stanly.....	Dr. V. A. Whitley.
Franklin	Dr. E. S. Foster.	Stokes	Dr. W. V. McCannless.
Gaston.....	Dr. J. H. Jenkins.	Surry	Dr. John R. Woltz.
Gates.....	Dr. W. O. P. Lee.	Swain.....	Dr. J. A. Cooper.
Graham	Dr. R. J. Orr.	Transylvania	Dr. C. W. Hunt.
Granville	Dr. S. D. Booth.	Tyrrell.....	
Greene.....	Dr. Joseph E. Grimsley.	Union	Dr. J. E. Ashcraft.
Guilford.....	Dr. Edmund Harrison.	Vance.....	Dr. Goode Cheatham.
Halifax	Dr. I. E. Green.	Wake.....	Dr. J. J. L. McCullers.
Harnett.....	Dr. O. L. Denning.	Warren.....	Dr. A. S. Pendleton.
Haywood	Dr. S. B. Medford.	Washington	Dr. W. H. Ward.
Henderson	Dr. J. G. Waldrop.	Watauga.....	Dr. T. C. Blackburn.
Hertford	Dr. John W. Tayloe.	Wayne.....	Dr. Williams Spicer.
Hyde	Dr. E. H. Jones.	Wilkes.....	Dr. J. M. Turner.
Iredell	Dr. Henry F. Long.	Wilson.....	Dr. W. S. Anderson.
Jackson.....	Dr. Wm. Self.	Yadkin	Dr. S. L. Russell.
Johnston	Dr. L. D. Wharton.	Yancey	Dr. J. L. Ray.

[You are asked to fill out and mail one of these forms to the Superintendent of Health of your county on or before the third of each month, that he may use it in making his report to the Secretary of the State Board.

Have any of the following diseases occurred in your practice during the month just closed. If so, state number of cases.

Whooping-cough	Typhoid Fever
Measles	Typhus Fever
Diphtheria	Yellow Fever
Scarlet Fever	Cholera
Pernicious Malarial Fever	Smallpox
Hemorrhagic Malarial Fever	Cerebro-spinal Meningitis

What have been the prevailing diseases in your practice?

.....

Has any epidemic occurred among domestic animals? If so, what?

.....

What is the sanitary condition of your section, public and private?

.....

General Remarks:

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.....M. D.

BULLETIN

OF THE

North Carolina Board of Health.

Published Monthly at the Office of the Secretary of the Board, Raleigh, N. C.

GEO. G. THOMAS, M. D., *Pres.*, Wilmington.
S. WESTRAY BATTLE, M. D., Asheville.
HENRY W. LEWIS, M. D., Jackson.
J. L. NICHOLSON, M. D., Richlands.

W. P. IVEY, M. D., Lenoir.
FRANCIS DUFFY, M. D., New Bern.
W. H. WHITEHEAD, M. D., Rocky Mt.
J. L. LUDLOW, C. E., Winston.

RICHARD H. LEWIS, M. D., *Secretary and Treasurer*, Raleigh.

VOL. XVI.

OCTOBER, 1901.

No. 7.

To the Physicians of the State.

It is with much gratification that we announce to the physicians of the State that we have perfected arrangements with the Biologist of the Department of Agriculture for further work in his line of value and importance in the protection of the public health in addition to the analyses of drinking water which he has been making for us since last December. He is now prepared to make examinations of sputum for tubercle bacilli of blood for the plasmodium malarie, Widal's test for typhoid fever and of exudates from the throat for the bacillus diphtherie. The last named is of special importance because it is now generally agreed (see resolutions of the National

Conference of State and Provincial Boards of Health printed in our last number) that it is not safe to dismiss a diphtheria patient from quarantine, although apparently well, until it has been shown by a bacteriological test that the bacilli are no longer present in the throat or nose. This applies with peculiar force to school children. The test cannot be made except in a laboratory, and heretofore we have been greatly handicapped in this respect. But now that the facilities are within reach at a cost of only a short letter and a few cents in postage, no physician can justify himself in turning loose among his school-fellows or playmates a child that has had diphtheria until these tests have been made. And all teachers should refuse to

re-admit to school any such child who does not bring a certificate from the health officer or attending physician that these tests have been made with negative results. We sincerely hope our physicians will avail themselves of the opportunities afforded. The following are the directions for sending samples:

DIRECTIONS FOR SENDING SAMPLES OF
PATHOLOGICAL MATERIAL.

1.—A limited number of samples of pathological material will be examined for physicians by the Biologist of the North Carolina Department of Agriculture. Such samples must be sent through the office of the Secretary of the State Board of Health and the application be endorsed by the Secretary. Applications from country physicians and County Superintendents of Health will receive preference. Work of this kind cannot be done for hospitals or sanitariums. Pathological material will not be examined unless there are clinical reasons for suspecting the presence of one of the microbes named in paragraph No. 4.

2.—Samples must be sent in vessels sterilized and prepared in the Department's laboratory. All samples must be taken by a physician according to the directions given on this sheet and must be fully described and certified on form given on reverse side of this sheet.

3.—All transportation charges on samples and containers must be paid by the sender.

4.—For the present only following-named material can be accepted to be examined for the microbes specified:

(a) Milk and sputum to be examined for *Bacillus tuberculosis*.

(b) Diphtheritic exudates to be examined for *Bacillus diphtheriae*.

(c) Blood to be examined for *Bacillus typhosus* and *B. anthracis*.

(d) Blood to be examined for Plasmodia of malaria.

5.—The following special rules must be observed in taking and sending samples:

(a) *Milk*: Collect 2 to 4 ounces preferably from strippings. The sterilized bottle sent will contain enough carbolic acid to prevent souring in transit. The bottle should not be entirely filled and care must be taken that the acid is not lost in sampling. Cork tightly, but do not use wax.

(b) *Sputum*: Have patient clean mouth and throat by taking a drink of clear water. Then have patient cough material from depths of throat or chest into a clean saucer. From this with a clean spoon fill the bottle, sent to two-thirds of its capacity; cork tightly.

(c) *Exudates*: Exudates for examination should not be taken within 6 hours after the application of antiseptics to the parts. Depress the tongue and with the sterilized swab sent rub firmly upon the affected part. Then replace swab and its handle in same wrapper in which it was received and mail at once. On no account should the cotton swab be touched with fingers or other objects.

(d) *Blood*: Samples of blood may be taken from lobe of the ear or from the finger just above the nail. Wash the part selected with soap and hot water and dry on clean towel. Then bathe in 70 per cent. alcohol or use pure whiskey. Let this dry spontaneously. Take a large steel needle—a darning needle or sewing machine needle is best—prick the part until the blood flows. Discard the first few drops.

If the blood is for Widal test, with the needle place 6 to 10 drops in the hollow

of the glass slip sent. Invert a tumbler over it and allow the blood to dry spontaneously. When dry, cover with thin glass slip. Wrap up and fasten with rubber bands. Pack in a well-padded box and mail. If blood is to be examined for the anthrax bacillus or malaria plasmodium, with the needle place 2 or 3 drops near the end of the thin glass slip, which should be laid on a flat surface. With the end of the thick slip held perpendicular, with a firm, sliding motion, draw the blood over the thin slip up to the other end, so as to leave a thin film on the latter. Let this dry for a few minutes. Then place the thick slip as a cover over blood film. Wrap up both slips and fasten with rubber bands. Mail in a well-padded box.

6.—Number or mark each sample on wrapper or container, and write same mark on descriptive form. Mark also the outside of container so that it can be identified. Keep a record of the number or mark on each sample, as report will be made by number only. Lack of proper marking or other evidences of carelessness will cause rejection of the sample! The Biologist assumes no responsibility for incorrect sampling.

7.—A report can usually be made within 24 hours after receipt of sample. State whether report is desired by telegraph—at receiver's charge—or by mail.

8.—The Biologist has no time for direct correspondence with physicians. As a rule he has no information to give other than that contained in his report. Address criticisms or remarks to the Secretary of the State Board of Health.

9.—Address samples as follows: *Department of Agriculture, Division of Biology, Raleigh, N. C.*

The Need for Greater Care in Making Examinations and in Sending Patients to the State Hospitals.

BY ISAAC M. TAYLOR, M. D., ASSISTANT
PHYSICIAN STATE HOSPITAL,
MORGANTON, N. C.

Presented to the Conjoint Session of Medical Society of North Carolina and N. C. Board of Health, Durham, N. C., May 22, 1901.

The enactment of Chapter 1, Public Laws of 1899, extended the work of the Superintendents of Health as County Physicians to a set of duties of very great importance to the State Hospitals for the Insane.

In prescribing that persons thought to be insane must be examined by the County Physicians without charge when application is made to them, it practically gives into their hands all these examinations, and the law was drawn making these officially responsible, that they might better inform themselves and might furnish more accurate data in regard to the persons whom they have examined than has heretofore been done.

The first and most important thing is the drawing and signature of the warrants and commitment; this is of course the duty of the Clerk of the Court, but a well-informed physician, with a knowledge of the law on the subject, and a common-sense understanding of the reasons for that law, can do much in the way of seeing that each blank is properly filled, that all affidavits are properly attested and that the signature and seal of the Clerk is affixed to the commitment.

All these show that legal inquisition has been regularly held, that proper persons have, under oath, given testimony and that the right of the insane per-

son to proceedings "by due process of law," and the right of society to protection from one whose enlargement is disadvantageous, if not dangerous to the community, have been respected.

Time after time papers must be returned because the legal forms have been carelessly executed, and therefrom arise delays and misunderstandings. Then, again, they may do much toward a proper observance of the law by having the examinations made by the Clerks instead of by magistrates, as is allowed under certain conditions. The examination of insane persons was put in the hands of the Clerks of Superior Court for the purpose of having a law officer of intelligence, education and legal knowledge and to make sure that there was a record made of the proceedings, and it is best that the Clerk should himself draw the papers.

After admission is obtained the medical examiner can benefit the insane person by seeing that there is less show of force, that handcuffs and ropes are abandoned, the patient clean, free from vermin, properly clothed, and always impressed with the fact that he is going to a hospital, not a prison. If restraint is necessary, a straight-jacket may be put on, or, as has once been used, a seamless sack with a hole cut for the head and sewed tightly about the body and arms makes a very efficient straight-jacket. For those in the Western District, the hospital at Morganton would willingly send a model for making a long-sleeved strong-jacket.

A sufficient number of people to care for a patient should accompany him, because an officer is not afraid of a patient or is strong enough to handle a patient alone, does not insure against bruises or rough handling, and for the

sake of decency, good morals and avoidance of scandal, a woman should be of the party when a female patient is sent from a distant point, especially if a night must be spent on the journey.

The purely medical part of the examination more properly concerns the Superintendents of Health, and this is written to beg them to answer fully the questions prescribed by law. These are not idle, but have been digested for years, and only those essential to a knowledge of the case and a partial prognosis remain.

It is particularly needed that careful replies be made now, since those selected for admission into the hospitals must be taken from a large number of applications, and the probable prognosis must entirely govern in naming the few who are to be selected.

The name, age and color are usually stated positively and satisfactorily. The occupation of the patient we wish to know for statistical purposes. This question is very loosely answered, when the least attention would give definite, concise information. The mechanical trades, of course, are usually indicated; a laborer should be designated as to occupation—a blacksmith's helper, farm laborer, a fireman, etc. It is particularly desirable that there be a distinction made between a farmer and a farm laborer, the answer farmer is too indefinite often to properly classify. House-work, housewife, are terms too comprehensive, meaning anything from a lady's maid to the wife of a ten-horse farmer.

We should know when the person asked about is a cook, house-servant, daughter of a farmer, wife of a farmer, washerwoman, etc. The widest departure in this direction I now remember is the reply that the occupation of the patient

was "Wading in the creek and throwing rocks."

The questions requiring two answers are every generally inadequately replied to, for instance: Has patient manifested any tendency to injure himself or others? If so, in what way, and how often? Is sometimes answered "Yes"; sometimes, "In various ways."

In what way is disease exhibited? is often answered, "In various ways." Has patient any family; if so, what persons compose it? Age of youngest child? "Two months old."

There seems a general confusion as to what is meant by an *attack of insanity*; it is variously answered, some recognizing no period of apparent good mental health as a recovery, others classing each separate demonstration of excitement or epileptic seizure as a fresh attack of insanity. We mean by an attack of insanity a period of continuous manifestation of mental disease, with only transitory return to normal mental balance. The manifestations may not be continuously of the same character, but may vary in type, embracing a period of mania and then of melancholia, with a short term of quiet when there is apparent near approach to normal.

The investigation into the cause of an attack is apparently often very superficial, little questioning as to heredity or nervous manifestations, in near relatives or forebears or reference to long evidence of general break down with following mental and nervous symptoms. If there is a religious element manifested in the symptoms the cause assigned is usually "religious excitement"; or if the insane person is a school-boy, "masturbation" is the favorite assigned cause; or if there is delusional accusation of husband or wife, "domestic trouble" is given.

We beg that our examining physicians look beyond the superficial appearances for physical defects, disease of organs, toxic causes from faulty elimination of excretions and the element of heredity, which plays such an important part and which is so often concealed; heredity meaning not simply that some relative has been insane, but there may in one generation be ill beath, in the next intemperance, in the next insanity, epilepsy or other neuroses.

The question in regard to epilepsy is of the greatest importance in prognosis, and with the clear description in almost every text-book on general medicine, it is remarkable how many blunder over this, classing hysterical convulsions as Epilepsy, Epileptic convulsions as Apoplectic, and the convulsions of infancy, so commonly a part of overfeeding and indigestion, as epileptic, with a general disregard of the less prominent and equally important "*pctit mal*."

There is apparently little difference in the minds of the general practitioners between delusions, hallucinations and illusions; these are most important, and the distinctions should be borne in mind. For the benefit of those who do not have clear knowledge of these terms, may I ask the indulgence of those who have, and quote here the definitions given by Dr. Blandford:

"A Delusion is a false belief in some fact which, generally speaking, personally concerns the patient, of the falsity of which he cannot be persuaded either by his own knowledge and experience, by the evidence of his senses or by the demonstration and declaration of others.

* * * * *

"Hallucinations are false perceptions of the senses, the eye, the ear, the nose, and so on. The hallucinated patient thinks he sees in the blackest darkness

or hears a voice through any number of thick walls, whereas his seeing or hearing is entirely subjective, taking place altogether within his own head, without any excitation conveyed to his organs from the outer world, when, in fact, he would hear and see the same were he deaf or blind.

"An Illusion is also a false perception of the senses or rather mistaken perception. There is something to see and something to hear; but that which the patient thinks he sees is not the real thing, but something else."

Illusions and hallucinations are common manifestations of insanity, and it is important in prognosis to distinguish between the two, particularly with regard to hallucinations of sight and hearing, the latter evidencing more extensive organic disease of the brain are found most often in chronic cases. Delusions are most important symptoms of mental disease, and investigation should be directed to ascertain if the delusions are systematized or of varying character. Delusions are not always spoken about, the attitude, habits and manner of patients often indicate the existence of delusions when a reference to them would cause a suspicious patient to deny and conceal any they may have.

The tendency of an insane person to violence should be fully looked into and the questions in the application fully answered, as the hospital officers, for the protection of the patients and for the prevention of accidents, should know from the first, what must be guarded against.

The questions as to mental and nervous disease in ancestors or kinsmen should be answered fully; it is only through the family physicians and the people at home that correct information

of this kind can be obtained, and while many conceal these facts, a word of explanation may bring out what cannot be otherwise ascertained.

The general physical condition has a direct bearing on the prognosis, and it is especially desirable to know of the existence of contagious disease, cancer and tuberculosis, and it is important to know if a patient is to come from home, or from county home or jail.

These observations may seem trivial and useless to those unacquainted with the average manner of answering the questions which the law prescribes, and, too, the fault does not lie with the backwoods members of the profession—many of our best practitioners regard the questions as formal and content themselves with answering them in the most terse way, concealing the facts for the sake of brevity in the answers. The best descriptions often come from uneducated persons, as we sometimes found under the law recently repealed, that the committing magistrate, whose composition was faulty and spelling worse, gave a more comprehensive description of a case than the medical witness who had testified before him.

In conclusion, let me beg that those who have honored this with their attention will apply it when next called to a case of this kind and will help our efforts to perfect and simplify the medical examinations and the legal processes.

Koch on Malaria and Blackwater Fever.

Professor Koch has recently made some noteworthy pronouncements on the origin of malaria and the most efficient mode of treatment, which, albeit somewhat belated, will be listened to with

great respect. He declared that he was convinced the mosquito acted as the intermediate host of the malarial-fever germ and that the only specific for that complaint was quinine. It is to be regretted, however, that in making this statement he seems to have quite ignored the researches and conclusions of the Italians, Bignami and Celli; and, above all, those of Manson and Ross. To a person who was unacquainted with the subject it would appear that Dr. Koch was propounding original views. However, it must be satisfactory to all concerned, and especially to Ross and Manson, that their work has received the seal of approval from so distinguished an investigator as the German scientist undoubtedly is. Another conclusion reached by Dr. Koch, that quinine is the cause of blackwater fever, has been received not only with skepticism by those physicians who have had experience in tropical diseases, but in the case of many with absolute disbelief. Dr. Manson said a short time ago that Koch's view of quinine origin of blackwater fever was altogether untenable; that blackwater fever was an intense form of malaria was not borne out by facts—the infection was usually a mild one. He thought the idea that it was due to a special type of malaria parasite, possibly resulting from passing through a special form of mosquito, or that it was a disease *sui generis* as had been held, was not improbable. The *Indian Medical Gazette* of a recent date says that Dr. Nuttall of Cambridge, some time ago sent to the editor of the *Deutsche medicinische Wochenschrift* a criticism of Koch which was refused publication in his absence. The *Indian journal* goes on to say that Professor Koch seems to be regarded in Germany as a sort of medical Kaiser whom to criticise is "lese majeste."—*Medical Record*.

Relative Merits of Slow Sand and Mechanical Filtration.

The fact that efficient filtration is the only true safeguard against typhoid fever is being slowly but surely borne in upon the minds of the American public. As to the best system of filtration, opinions vary in this country; up to the present, mechanical filtration has held sway. However, it would now appear that this mode of cleansing water of deleterious matter has been weighed in the balance and found wanting. Certain it is that in European cities and in American cities in which sand filtration has been established the mortality from typhoid fever has decreased rapidly. The initial cost of slow sand filtration is more than that of mechanical, but probably this is counterbalanced by the greater working expense of the latter method and by the quicker deterioration of plant. Mr. Gallinger has recently presented in the Senate the report made by a special committee of the Medical Society of the District of Columbia upon the relative merits of slow sand and mechanical filtration, which contains valuable information on the subject. It is shown that, putting aside the economical merits of the question, the relative aspect of the two systems, viewed from the standpoint of public health, slow sand filtration exhibits an undoubted superiority. It appears that mechanical filters have accomplished little in reducing typhoid fever death rates. The mortality rates from this disease are compared between five American cities using the mechanical devices, and five cities in Europe using water from sand filters. The results are as follows: Europe—Berlin, 5 per 100,000; Breslau, 9 per 100,000; Hamburg, 9 per 100,000; Rotterdam, 2 per 100,000; The Hague, 5 per 100,000; average, 6 per

100,000. United States—Davenport, 26 per 100,000; Atlanta, 43 per 100,000; Chattanooga, 48 per 100,000; Quincy, Ill., 58 per 100,000; Knoxville, 59 per 100,000; average, 46.8. That is, the American rate was almost eight times as great as the foreign rate. Concerning the comparative bacterial efficiency of the systems, the report says difficulty has been experienced by some in reconciling the comparatively slight failure of the mechanical filter in bacterial efficiency with its marked failure in diminishing the prevalence of typhoid fever, but by experiments made with water from the Potomac filtered by both methods the sand filter easily demonstrated its superiority in getting rid of bacteria. At the annual convention of the American Society of Civil Engineers held on July 3 and 5, 1900, Dr. Ad. Kemna (Antwerp, Belgium) said in part: "The action of sand filtration is essentially a biological one. The mechanical action of straining is obvious; but as microbes are smaller than the interstices between the grains, this action alone does not account for their retention, and it is absolutely inadequate for the reduction of the dissolved organic matter. Various theories have been proposed. The one which considers reduction as a fermentation is consistent with the greatest number and the greatest variety of facts.

The fact should be emphasized that sand filtration is not an artificial or theoretical process; that it is a natural process, especially because that process is exactly like what goes on in the purification of streams, which invalidates the sentimental argument against purified river water." Mr. Walter Hunt, engineering director of the Grand Junction

Water Works Company, London, England, which use sand filters, at the same meeting spoke as follows: "After all, the greatest testimony as to the quality of any water is found in the statistics in regard to the health of the community supplied. The admirable way in which the water supply of London is conducted, for instance, can be so shown. When the death rate in the metropolis is, as it was a week or two ago, something between 12 and 13 per 1,000, and when the average for the year continues from year to year to be something between 17 and 19, and when, too, the very small amount of typhoid fever which we have in this enormous city is noticed, the inference that the filtration of water is carried out in a very admirable way, and that the community has no need to fear in regard to the quality of that water, seems fully justified. We are able to deal with it absolutely well by sand filtration, taking out something like from 98.99 per cent. or 99.999 per cent. of the microbes, and the chemical analyses as made by Sir William Crookes and Professor Dewar, and also by the government analyst, Dr. Thorpe, are most satisfactory." Sand filtration has been proved in instance upon instance to be effective in checking the spread of typhoid, and, after all, this is the most convincing testimonial to its merits. Its primary cost is greater and it requires more space; but, on the other hand, mechanical filtration is more expensive to operate and requires the greatest care in the artificial chemical processes which constitute the system. Sand filtration is a natural process and has given better practical results than any form of mechanical filtration yet in vogue.—*Medical Record*.

Review of Diseases for September, 1901.

NINETY-ONE COUNTIES REPORTING.

Ninety-four counties have Superintendents of Health.

Except in the case of the more contagious and dangerous diseases the Superintendent has, as a rule, to rely upon his own information alone, since few physicians can be induced to report cases of non-contagious diseases to him.

Where the number of cases is not given or the prevalence of a disease otherwise indicated, its mere presence in the county is to be understood as reported.

For the month of September the following diseases have been reported from the counties named:

MEASLES.—Beaufort, 4 cases; Burke, 1; Cleveland, a few; Granville, 3; McDowell; Moore, a few; Polk, 1; Vance, several; Watauga, a few—9 counties.

WHOOPING-COUGH.—Beaufort, 3; Bladen, a few; Caldwell, 20; Catawba, 3; Clay, 2; Cleveland, a few; Cumberland, a few; Currituck, a few; Dare, 38; Davie, 1; Durham, a few; Granville, 4; Harnett, 4; Iredell, 6; Mecklenburg; Moore, a few; Orange, a few; Polk, 1; Randolph; Rowan, 2; Rutherford, a few; Union, 6; Vance, several; Wilson, 1—24 counties.

SCARLET FEVER.—Alexander, 25; Brunswick, 3; Buncombe, 30; Cabarrus, 12; Caldwell, 4; Caswell, 10; Catawba, 24; Clay, in all parts; Durham, 20; Edgecombe, several; Franklin, in several parts; Granville, 4; Halifax, 2; Haywood, 4; Henderson, 2; Iredell, in all parts; Macon, 5; Mecklenburg; New Hanover, 4; Orange, 12; Person, 2; Polk, 6; Rockingham; Rutherford, a few; Stanly, 3; Swain, 20; Union, 1; Wake,

5; Warren 1; Watauga, several; Yadkin, 47; Yancey, several—32 counties.

DIPHTHERIA.—Alamance, 1; Beaufort, 4; Cleveland, several; Davidson, 2; Franklin, 2; Granville, 1; Guilford, 1; Haywood, 5; Lincoln, 3; Mecklenburg; New Hanover, 1; Orange, 2; Robeson, 1; Rowan, 4; Rutherford, 2; Wake, 2; Wilkes, 6—17 counties.

TYPHOID FEVER.—Alexander, 20; Alleghany; Ashe, 6; Brunswick, 2; Buncombe, 6; Burke, 20; Caldwell, 10; Caswell, several; Catawba, 13; Chatham; Clay, a few; Cleveland, a few; Columbus, many; Craven, 10; Cumberland, a few; Currituck, a few; Durham, 1; Edgecombe, 2; Gaston, a few; Granville, 5; Greene, 25; Guilford, 4; Halifax, several; Harnett, many; Haywood, 18; Henderson, 5; Iredell, in all parts; Jackson, 6; Jones, 3; Lincoln, 2; McDowell; Macon, several; Madison, 7; Mecklenburg; Nash, 5; New Hanover, 1; Onslow, 2; Orange, a few; Pender, 2; Perquimans, 2; Person; Pitt, in all parts; Polk, 3; Randolph, 30; Richmond, a great many; Robeson, in nearly all parts; Rockingham, in all parts; Rowan, 6; Rutherford, several; Sampson, a few; Scotland, 4; Stanly, in all parts; Stokes, 20; Swain, 3; Union, several; Vance, in all parts; Wake, 20; Warren, 12; Washington, 1; Watauga, a few; Wayne, several; Wilkes, 4; Wilson, 2; Yadkin, 2; Yancey, a few—65 counties.

MALARIAL FEVER.—Alamance, general; Anson; Beaufort; Bertie, general; Bladen, a few; Brunswick; Cabarrus, general; Carteret; Caswell, general; Catawba; Chatham; Chowan, general; Columbus; Craven; Cumberland; Currituck, general; Duplin, a good deal; Franklin; Gaston, Gates, general; Granville; Greene, general; Guilford; Halifax;

Hyde, Iredell, Jones, Lenoir, Martin, New Hanover, Northampton, Onslow, Orange, general; Pasquotank, in several parts; Perquimans, general; Person; Randolph, general; Robeson, in nearly all parts; Rockingham, general; Sampson, in nearly all parts; Scotland; Warren; Washington, general; Wilson—44 counties.

MALARIAL FEVER, PERNICIOUS.—Beaufort, 4; Brunswick, 1; Craven, 1; Hyde, 2; Northampton; Warren, 2—6 counties.

MALARIAL FEVER, HEMORRHAGIC.—Chowan, 6; Craven, 2; Franklin, 1; Gates, 1; Jones, 1; Mecklenburg, 1; New Hanover, 2; Northampton, several—8 counties.

BOWEL DISEASE, INCLUDING DYSENTERY.—Alleghany; Harnett; Pitt; Lenoir.

SMALL-POX.—Guilford, 1; Henderson, 13; Mecklenburg, 3; Nash, 2; Randolph, 2; Rockingham, 4; Rutherford, 3; Vance, 1—8 counties.

CHOLERA IN HOGS.—Bertie; Chatham; Chowan; Dare; Gates; Lenoir; Northampton; Onslow; Randolph; Robeson—10 counties.

SPINAL MENINGITIS IN HORSES.—Randolph.

STAGGERS IN HORSES.—Chowan; New Hanover.

No diseases reported from Graham, Johnston, Mitchell, Surry and Transylvania.

No reports received from Cherokee, Hertford and Montgomery.

Summary of Mortuary Reports for September, 1901.

(TWENTY-THREE TOWNS).

Aggregate popula- tion.....	White.	Col'd.	Total.
Aggregate deaths...	72,920	50,550	123,470
Representing tem- porary annual death rate per 1,000.....	88	112	200
<i>Causes of Death.</i>			
Typhoid Fever.....	8	3	11
Scarlet Fever.....	1	0	1
Malarial fever	11	13	24
Diphtheria.....	1	1	2
Whooping-cough ..	1	3	4
Pneumonia.....	4	6	10
Consumption.....	9	9	18
Brain diseases.....	9	6	15
Heart diseases.....	8	6	14
Neurotic diseases..	4	8	12
Diarrhœal diseases	4	12	16
All other diseases..	25	42	67
Accident	3	2	5
Violence	0	1	1
	88	112	200
Deaths under five years.....	39	46	85
Still-born.....	10	13	23

Mortuary Report for September, 1901.

TOWNS AND REPORTERS.	RACES.	POPULATION.		TEMPORARY ANNUAL DEATH RATE PER 1,000.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrhoeal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	By Races.	By Towns.	Total Deaths. Under five years.	Still-born.	
		By Races.	Total.	By Races.	Total.																					
Charlotte	W.	11,000		13.1		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	12	22	5	2
Dr. F. O. Hawley.	C.	7,200	18,200	16.7	15.8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	8	5	...
Durham	W.	10,000	*	10.8		1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9	21	...	1
Dr. N. M. Johnson.	C.	5,000	15,000	28.8	16.8	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	12	...	...	...
Fayetteville	W.	2,500		14.4		...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	3	7	1	...
Dr. John D. MacRae.	C.	2,300	4,800	20.9	17.5	1	...	...	...	...	...	...	...	...	...	...	...	1	2	...	...	4	7	3	...
Goldsboro	W.	3,400		21.2		1	...	...	...	...	...	...	1	1	...	...	...	2	1	...	...	6	13	2	2
Geo. E. Hood, Mayor.	C.	2,600	6,000	32.3	26.0	1	...	...	...	...	...	1	1	1	1	...	...	2	...	...	...	7	4	1	...
Henderson	W.	2,300		4.8		...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	2	1	...
Dr. F. R. Harris.	C.	1,500	3,800	8.0	6.3	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Laurinburg	W.	900		26.7		...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...
Dr. A. W. Hamer.	C.	600	1,500	0.0	16.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	...	...	...
Lenoir	W.	1,200		10.0		1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	2	...	...
Dr. A. A. Kent.	C.	300	1,500	40.0	16.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Marion	W.	800		15.0		...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	0	1	...	...
Dr. B. A. Cheek.	C.	350	1,150	0.0	10.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1
Monroe	W.	1,850		0.0		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	0	...	...
Dr. J. M. Blair.	C.	600	2,450	0.0	0.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	...	...	...
Oxford	W.	1,200		10.0		...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	0	1	1	...
Dr. S. D. Booth.	C.	900	2,100	0.0	5.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Raleigh	W.	8,000		15.0		1	...	...	...	...	...	...	...	3	...	...	...	4	1	...	...	10	22	3	2
T. P. Sale, Clerk B. H.	C.	5,800	13,800	24.8	19.1	...	...	1	...	1	...	...	2	2	1	...	1	3	1	...	...	12	5	1	...
Reidsville	W.	2,900		8.3		...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	2	4	...	...
Jas. T. Smith, Cy. Cl.	C.	1,300	4,200	18.5	11.4	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	1
Rockingham	W.	1,500		16.0		...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	2	2	1	...
Dr. Wm. P. S. Webb.	C.	500	2,000	0.0	12.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	...	...	...
Rocky Mount	W.	1,500		0.0		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	1	...	...
Dr. G. L. Wimberley, Jr	C.	1,600	3,100	7.5	3.9	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...
Salisbury	W.	3,900		15.1		1	...	1	...	...	...	...	1	...	...	...	...	2	...	...	...	5	7	3	1
Dr. W. W. McKenzie.	C.	2,500	6,400	9.6	13.1	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	2	...	...	...
Scotland Neck	W.	1,000		12.0		...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	1	...	1
Dr. J. P. Wimberley.	C.	500	1,500	0.0	8.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	...	...	...
Smithfield	W.	620		19.3		1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	2	...	...
J. C. Bingham, Mayor.	C.	450	1,070	26.7	22.4	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...
Southport	W.	900		40.0		...	...	...	...	...	...	...	1	...	...	...	...	2	...	...	...	3	4	1	...
Dr. D. I. Watson.	C.	500	1,400	24.0	34.3	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...
Tarboro	W.	2,000		6.0		...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	2	1	...
Dr. L. L. Staton.	C.	500	2,500	24.0	9.6	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...
Washington	W.	2,300		26.1		1	...	1	...	...	...	...	1	...	...	...	...	2	...	...	...	5	12	2	...
Dr. Jno. G. Bount.	C.	2,600	4,900	32.3	29.4	...	...	3	...	...	...	...	1	...	...	...	2	1	...	...	...	7	...	...	...
Weldon	W.	700		0.0		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	1	...	1
J. T. Gooch, Mayor.	C.	750	1,450	16.0	8.2	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...
Wilmington	W.	10,600		22.6		...	...	8	...	...	...	...	2	...	1	3	1	5	...	...	...	20	60	11	1
Dr. Chas. T. Harper.	C.	10,500	21,100	45.7	34.2	...	...	9	...	...	...	...	5	1	1	5	7	11	...	...	...	40	20	3	...
Wilson	W.	1,850		13.0		1	1	2	11	7	...
Dr. W. S. Anderson.	C.	1,700	3,550	63.5	37.2	...	...	...	1	...	...	...	...	...	...	...	1	1	6	...	...	9	...	...	...

N. B.—The reporters for the cities and towns printed in **Black Type** have signed this certificate: "I hereby certify that this report gives the *whole* number of deaths occurring within the corporate limits during the above month." The total populations are taken from the census report for 1900, but the division into races is estimated, as those figures have not been given out.

*This is the estimate of the reporter since the extension of the city limits.

County Superintendents of Health.

Alamance	Dr. H. R. Moore.	Jones.....	Dr. S. E. Koonce.
Alexander	Dr. C. J. Carson.	Lenoir	Dr. C. L. Pridgen.
Alleghany	Dr. B. C. Waddell.	Lincoln	Dr. T. F. Costner.
Anson	Dr. J. H. Bennett.	McDowell	Dr. B. A. Cheek.
Ashe.....	Dr. J. W. Colvard.	Macon	Dr. F. L. Siler.
Beaufort	Dr. Jno. G. Blount.	Madison	Dr. Jas. K. Hardwicke.
Bertie	Dr. H. V. Dunstan.	Martin	Dr. W. H. Harrell.
Bladen.....	Dr. Newton Robinson.	Mecklenburg.....	Dr. C. S. McLaughlin
Brunswick	Dr. J. A. McNeill.	Mitchell.....	Dr. V. R. Butt.
Buncombe	Dr. E. B. Glenn.	Montgomery	Dr. M. P. Blair.
Burke.....	Dr. J. L. Laxton.	Moore.....	Dr. Gilbert McLeod.
Cabarrus.....	Dr. R. S. Young.	Nash	Dr. J. P. Battle.
Caldwell	Dr. A. A. Kent.	New Hanover	Dr. W. D. McMillan.
Camden.....		Northampton.....	Dr. H. W. Lewis.
Carteret	Dr. F. M. Clark.	Onslow.....	Dr. E. L. Cox.
Caswell	Dr. S. A. Malloy.	Orange.....	Dr. D. C. Parris.
Catawba	Dr. Geo. H. West.	Pamlico.....	
Chatham.....	Dr. H. T. Chapin	Pasquotank	Dr. H. T. Aydlett.
Cherokee.....	Dr. J. W. Patton.	Pender.....	Dr. J. R. Thomson.
Chowan.....	Dr. T. J. Hoskins.	Perquimans.....	Dr. C. C. Winslow.
Clay	Dr. J. O. Nichols.	Person	Dr. J. A. Wise.
Cleveland	Dr. B. H. Palmer.	Pitt.....	Dr. C. O'H. Laughling- house.
Columbus.....	Dr. I. Jackson.	Polk	Dr. Earle Grady.
Craven.....	Dr. N. H. Street.	Randolph	Dr. S. A. Henley.
Cumberland.....	Dr. Jno. D. McRae.	Richmond.....	Dr. Wm. P. Webb.
Currituck	Dr. H. M. Shaw.	Robeson	Dr. H. T. Pope.
Dare	Dr. W. B. Fearing.	Rockingham	Dr. Sam Ellington.
Davidson	Dr. Joel Hill.	Rowan.....	Dr. W. L. Crump.
Davie	Dr. James McGuire.	Rutherford.....	Dr. T. B. Twitty.
Duplin	Dr. O. F. Smith.	Sampson	Dr. R. E. Lee.
Durham	Dr. N. M. Johnson.	Scotland	Dr. A. W. Hamer.
Edgecombe	Dr. L. L. Staton.	Stanly.....	Dr. V. A. Whitley.
Forsyth.....	Dr. John Bynum.	Stokes	Dr. W. V. McCanless
Franklin	Dr. E. S. Foster.	Surry	Dr. John R. Woltz.
Gaston.....	Dr. J. H. Jenkins.	Swain.....	Dr. J. A. Cooper.
Gates.....	Dr. W. O. P. Lee.	Sylvania	Dr. C. W. Hunt.
Graham	Dr. R. J. Orr.	Tyrrell.....	
Granville	Dr. S. D. Booth.	Union	Dr. J. E. Ashcraft.
Greene.....	Dr. Joseph E. Grimsley.	Vance.....	Dr. Goode Cheatham,
Guilford.....	Dr. Edmund Harrison.	Wake.....	Dr. J. J. L. McCullers.
Halifax.....	Dr. I. E. Green.	Warren.....	Dr. A. S. Pendleton.
Harnett.....	Dr. O. L. Denning.	Washington	Dr. W. H. Ward.
Haywood	Dr. S. B. Medford.	Watauga.....	Dr. T. C. Blackburn.
Henderson	Dr. J. G. Waldrop.	Wayne.....	Dr. Williams Spicer.
Hertford	Dr. John W. Tayloe.	Wilkes.....	Dr. J. M. Turner.
Hyde	Dr. E. H. Jones.	Wilson.....	Dr. W. S. Anderson.
Iredell	Dr. Henry F. Long.	Yadkin	Dr. S. L. Russell.
Jackson.....	Dr. Wm. Self.	Yancey	Dr. J. L. Ray.
Johnston	Dr. L. D. Wharton		

BULLETIN

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VOL. XVI.

NOVEMBER, 1901.

No. 8.

The Etiology of Tuberculosis.

BY GERALD MCCARTHY,
Biologist North Carolina Department
of Agriculture.

Tuberculosis, Phthisis, Consumption or the "Great White Plague," as it is differently called, is one of the most anciently described diseases, having been known in the time of Moses. It is, however, only within the last twenty years that its etiology has been scientifically explained. During the last fifty years the spread of this disease among domesticated animals has been very rapid and the losses caused have been appalling. Among humans the mortality due to consumption has been decreasing during the last twenty years, except as regards the form called *tubercles mesenterica*, most common among children from one to five years, who are fed upon cows' milk.

According to a recent address of Dr. J. M. Emmert, President Iowa State Medical Society, consumption kills annually in the whole world about 5,000,000 persons; exceeding by far the world's combined losses from war, famine, fire and flood.

The statistics collected by the North Carolina State Board of Health show in 1900 for 21 towns having an aggregate population of about 150,000, 224 deaths from consumption. This is a rate per 100,000 of about 150. The same report gives for other principal diseases the following death rate per 100,000:

Typhoid	59
Malaria	60
Pneumonia	136
Neurotic diseases	36

Among domesticated animals subject to tuberculosis the dairy cow ranks as

most susceptible, and the pig next. The dog, cat, horse, sheep, mule and ass rank in susceptibility in the order given. Among animals in the feral state known to contract tuberculosis may be mentioned the lion, tiger, bear, giraffe and monkey. Birds are also susceptible, more especially domesticated fowls. Rats and mice are frequently infected. So far as known, tubercular infection occurs, except in very rare and probably accidental cases, only after birth. The disease is not hereditary or congenital.

The French investigators, Villemin in 1865, and Chauveau in 1868, demonstrated that consumption was an infectious disease due to a specific germ or poison. It was not however until 1882 that the organism was isolated and its causal connection with the disease demonstrated by Dr. Robert Koch, of Berlin.

Bacillus tuberculosis, the efficient cause of consumption in all its forms and phases, is described as follows: Non-motile, rod-shaped, $2\frac{1}{2}$ to $3\frac{1}{2}$ microns in length by about 1-3 micron in breadth, stains with difficulty in boiling carbol-fuchsin. Decolorizes with still greater difficulty,—will withstand 25 per cent. sulphuric acid or 35 per cent. nitric acid. The stained bacillus shows polar spots resembling spores. Its behavior otherwise also indicates spore formation, but the extreme minuteness of the organism renders it difficult to determine this point. This bacillus grows only at body temperature on solidified blood serum, glycerine agar and glycerine broth. In the growing condition the bacilli are killed by a moist temperature of 70 degrees C. (158 degrees F.) in half hour. They are killed by boiling temperature in less than one minute. In the dried (sporiferous!)

state the bacteria resist a temperature over 212 degrees F.; no amount of cold seems to affect them. They also resist the action of the gastric juice for over six hours. They do not putrify in actively decaying solutions for months.

The bacilli are killed by a 1 per cent. solution of carbolic acid in one minute and by a 1 per mille solution of corrosive sublimate in ten minutes. Direct sunlight is rapidly fatal to them. The tubercular bacilli isolated from different animals show differences in morphology and growth, but these differences are only temporary variations due to difference in environment. There is believed to be but one species of the bacillus of tuberculosis. This has been isolated from humans, mammals, rodents, birds and fishes.

Dr. Robert Koch, who first described the bacillus of tuberculosis, has more recently caused a sensation by expressing his conviction that the bacilli as found in humans and in animals are distinct species, and that the disease is therefore not communicable from animals to men, and *vice versa*. This opinion of Koch is diametrically opposed to clinical experience and cannot be accepted without much more satisfactory proof than is at present offered. The creation of specific names for natural forms showing slight differences in morphology or biology is not at the present day encouraged by the most reputable leaders in biological science. "Species" are at best largely subjective entities. Hansen, the eminent Danish investigator, dealing with unicellular yeasts, has shown that by subjecting these simple cellular bodies to different environments for a number of generations he can from one and the same original create almost an infinite number of so-called species. These crea-

tions remain true to their new characters so long as the proper environment remains constant. But a change in environment produces a parallel change in character of the organism, so that by reversing the original process the character of the organism may be again returned to the starting point. These facts have a direct and very important bearing upon the question of specific identity of the tuberculous bacteria obtained from bodies of humans and animals. They make us very skeptical as regards the value of Dr. Koch's latest discovery!

Tuberculosis in cattle.

At the present writing, November, 1901, the latest statistics show the prevalence of tuberculosis among dairy cattle to be something like ten per cent. in Eastern United States—being greatest in the dairy regions supplying the larger cities. In the Western States,—i. e., beyond the Missouri river,—the disease is not common. It is not very common anywhere among beef cattle—steers—reared on pasture. Next to dairy cows bulls are infected. In England the disease has infected twenty-six per cent. of the dairy cattle and a smaller proportion of breeding and beef stock, causing an annual loss to the farmers of England of about \$15,000,000. In Holland ten per cent. of dairy cattle are infected; in Denmark twenty per cent; in Saxony thirty per cent; in Prussia sixteen per cent; in France, ten to twenty-five per cent.

Where restrictive measures are not systematically and vigorously enforced tuberculosis spreads very rapidly where cattle are kept in large herds or wherever the herds are crowded into badly ventilated stables.

In England considerable attention has been given to studying the relative

immunity of different breeds of cattle. It has been found that in the Channel Islands,—the home of the Jersey cattle—dairy cattle are practically exempt from tuberculosis. In England the southwestern coast counties show but seven per cent. tuberculous against thirty-three per cent in eastern coast counties. Everywhere in England the Jerseys show the least and the dairy Short-horns the greatest per cent. of tuberculous animals. In the United States, so far as statistics go, the Jerseys show the greatest susceptibility to tuberculosis. The Short-horns are extensively infected. The rugged breeds, such as Ayrshires and Red-polls, are least infected. In-and-in breeding and injudicious coddling have been the causes of the extensive infection of Jersey and Short-horn cattle.

The infectiousness of milk from tuberculous cows.

The infectiousness of milk from cows having tuberculous lesions of the udder is known to be most virulent. Bang in Denmark and other specialists in tuberculosis have published numerous cases of apparent infection of humans by milk of tuberculous cows. The inoculation of guinea-pigs with such milk is invariably and quickly followed by death from generalized tuberculosis. Recent experiments in the laboratory of the Pennsylvania Live Stock Commission have shown conclusively that the milk of cows reacting to the tuberculin test, but showing no lesion of the udder either during life or after death, may still contain virulent tuberculous germs! Approximately one-half the cows having well-advanced cases of tuberculosis, but no lesions in udder, give milk containing the virulent bacillus.

In every dairy herd in which there are two or more well-developed cases of tu-

bereulosis it is pretty certain that one or more of the cows give virulent bacilli in the milk. As the milk from the entire herd is commonly put into one bulk before it reaches the consumer, the danger of transmitting the disease is nearly as great as if every cow in the herd gave infected milk.

It should be borne in mind however that the bacillus of tuberculosis does not increase at ordinary atmospheric temperatures. But a single germ in the body may increase to millions in a few days.

This bacillus is every frequently found in butter and less often in cheese as sold in the market. In Berlin Hormann and Morgenroth found the bacillus in three out of ten samples of butter bought in the market. In another city Obermann found seven out of ten samples infected. Morgenroth also tested the oleomargarine sold in Berlin and found the tuberculous germs in nine out of twenty samples. As oleomargarine is made largely from the fat of tuberculous glands, and is further during the manufacturing process churned with cows' milk, the chances for infection are much greater than in case of pure butter.

The sterilization of milk so as to insure its freedom from the bacillus of tuberculosis has occupied much of the time of experimenters. The results have been very contradictory. But the most conservative experimenters and hygienic commissions have decided that no temperature short of the boiling point can be safely depended upon. Boiling for thirty seconds is a sure safeguard. Heating to eighty-five degrees C. (185 degrees F.) for ten minutes is the lowest allowable sterilizing temperature. This however gives the "boiled taste" so much disliked. The lowest temperature at which the boiled taste appears is 160 degrees F.

Some American investigators recommend heating to seventy degrees C. (158 F.) for one-half hour in a *closed* vessel. When heated in an open vessel a film soon forms on surface and this protects the bacteria so that not even an hour's heating will destroy them. This is a case in which the consumer must decide for himself. The careful man will try in the first place to secure milk that is free from filth and disease germs. This is the best plan. Those who must use milk of whose quality they have no guarantee must decide whether for the sake of the "raw taste" they have been accustomed to they will take the chances of getting "raw" tubercular bacteria in their coffee. Those who want to take no chances will boil the milk for a minute. Those who wish to steer a middle course between the Charybdis of consumption and the Scylla of "boiled taste" will heat the milk to 158 degrees F. for one-half hour. It may here be stated that so far as known no tuberculous germs have been found in the condensed milk sold in sealed cans.

The infectiousness of tuberculous meat.

The danger of contracting consumption by eating cooked meat is very remote. The nature of the bacillus of tuberculosis is to localize itself in one or more of the internal organs which are commonly regarded as offal. Healthy muscular tissue seems to contain a substance destructive to the tubercular bacillus. The bacillus therefore rarely attacks the muscular tissue until the animal has become so weakened and emaciated that the flesh is past eating. The temperature used for boiling or baking meat is fatal to the germ of consumption. But when the meat is cooked in large joints of six pounds or more the killing temperature does not reach the center, es-

pecially in case of "rare-done" beef. The "toxine" produced by the bacillus in a living body is too minute to be of any consequence. Well-boiled tubercular flesh is not unwholesome. The best hygienic measures as regards meat are summed up in the rules governing inspectors of abattoirs in Germany and England. They are as follows:

PRUSSIA:

Rule I.—The flesh of a tuberculous animal is to be considered unwholesome when tubercles are found in the flesh or if the animal is emaciated even if there are no tubercles in the flesh.

Rule II.—The flesh of a tuberculous animal may be considered safe:

(1) When lesions are confined entirely to one organ.

(2) When several organs are infected but all within one cavity of the body and connected with each other directly or through lymphatic channels or blood vessels which are not part of the general circulatory system."

ENGLISH REGULATIONS:

"1.—The entire carcass of a tuberculous animal shall be seized and condemned:

(a) When there is miliary tuberculo-sis of both lungs.

(b) When the lesions are present in both pleura and peritoneum.

(c) When the lesions are present in the muscular system or in the lymphatic glands embedded in or between the muscles.

(d) When the lesions exist in any part of an emaciated carcass.

2.—The carcass of a tuberculous animal shall not be wholly condemned, but the parts containing the lesions shall be destroyed:

(e) When the lesions are confined to

the lungs and thoracic lymphatic glands or to the liver.

(f) When the lesions are confined to the pharyngeal lymphatic glands.

(g) When the lesions are confined to any combinations of the foregoing, but are collectively small in extent."

In addition to above rules the Royal Commission recommended the following:

"In consequence of the greater tendency to generalization of tuberculosis in the pig, the presence of tubercular deposits in any degree shall involve the seizure of the entire carcass and of all the internal organs.

"In respect to imported dead meat, seizure shall ensue in every case where the pleura have been stripped."

Hygienic and legal control of tuberculosis.

All the great advances of modern sanitation have been secured by well-organized State control and compulsion. In other words, the modern comparative freedom from pestilential diseases is due to an enlightened State policy based upon experimental science and enforced by laws, whose execution is usually devolved upon some board or body clothed with coercive powers, appointed by the State.

The "Great White Plague," now claiming its 5,000,000 victims yearly, will be reduced to the innocuousness of cholera and small-pox when it is dealt with in the same spirit—and not until then.

In the meantime, for public information and to place in view a goal to be aimed at, the following proposed regulations have been collated from those recommended by several State and foreign boards of health, and are hereby offered for the consideration of the medical profession and sanitarians of North Carolina:

AXIOM:

Tuberculosis is a DANGEROUS, infectious disease like small-pox and diphtheria and more destructive than either to human life.

Rule I.—All householders harboring consumptive persons shall notify the local health authorities of the fact, not necessarily for quarantine, but for special oversight and instruction on part of local health officers.

Rule II.—Consumptives shall be required to use special and individual cuspidors, which shall be always kept moist and shall be cleansed and disinfected at least once a day. When abroad such consumptives shall carry a supply of paper napkins and a paraffined envelope or liquid-tight receptacle into which the napkins shall be placed after being used. These napkins, after use, shall be burned as soon as possible.

Rule III.—In all hotels and public rooms where cuspidors are provided these shall be cleansed and disinfected daily and sufficient of a two per cent. solution of carbolic acid or a three per cent. solution of copper sulphate shall be kept therein to promptly destroy the germs of infected sputum. No one shall be permitted to spit anywhere but into such prepared vessels.

Rule IV.—Any person who has a habitual cough and rises sputum should have a sample of the sputum examined by a bacteriologist for the germ of consumption.

Rule V.—The urine and feces of known consumptives shall be disinfected with a four per cent. solution of carbolic acid before being cast into any privy or pit. The clothing, especially the linen and handkerchiefs, of such persons should not be bulked with similar articles of healthy persons, but washed

and thoroughly boiled separately. Public laundries should not receive such articles from consumptives.

Rule VI.—Consumptives should sleep alone. Their sleeping rooms should be well-ventilated with exit for foul air from near floor. The rooms should be well-lighted with free southern exposure. In sweeping and dusting such rooms the sweeper should wear a respirator—dampened sponge or flannel cloth—over nose and mouth. The floor should be dampened before sweeping. Fumigate frequently, with formaldehyde gas or burning sulphur. No healthy person should attempt to occupy a room vacated by a consumptive before it has been thoroughly fumigated and washed with four per cent. of carbolic acid, or 1 to 1000 solution of bichloride of mercury.

Rule VII.—Consumptives should beware of catching cold and of getting chilled. The tubercular bacillus increases its destructive work at such times.

Rule VIII.—Every community should take efficient measures to prevent travelers infected with tuberculosis from disseminating the disease in the locality.

Rule IX.—Every community should provide efficient regulations for preventing the sale of tubercle infected meat and milk and unsterilized second-hand clothing.

The restriction of tuberculosis among cattle.

The control of tuberculosis in cattle is much more easily accomplished than in case of humans. It is along this line that the best anti-tuberculosis work is being done. Most municipalities in the Northern States have rules and inspectors for discovering and destroying infected meat and milk. Considering the

general spread of tuberculosis among dairy cattle and the known infectiousness of the milk of at least one-half such infected cows, it is criminal on the part of local health authorities to neglect to provide rules and inspectors to prevent the sale of infected milk and meat.

The following rules have been collated from those in force in various cities and towns, and are recommended for the serious and immediate consideration of local health boards in North Carolina:

Rule X.—No person shall be permitted to vend milk within any incorporated town unless he shall have received a license from the local board of health or health officer or physician or the corporation.

Rule XI.—No license shall be issued to any dairyman until every one of his cows have been tested with tuberculin and found free from infection. Furthermore, no license shall be issued until the premises, milk vessels, feeding arrangements and working force of such dairy farm have been inspected and approved by a competent physician or veterinarian. No license shall be for a longer period than one year and may be forfeited at any time by infraction of the rules of the local board or health officer.

Rule XII.—No licensed dairyman shall bring any cow, calf or bull upon his premises until the same has been tested and permitted by the local inspector. No new hand shall be employed about the cows until such person shall have been examined and approved by the inspector.

Rule XIII.—The local inspector shall cause samples of milk and butter from every licensed dairy to be examined by a competent bacteriologist at least quarterly. He shall personally inspect the premises, vessels, etc., of each dairy once a quarter or oftener.

Rule XIV.—No person known to have consumption or any eruptive contagious disease shall be permitted to work about a dairy barn or handle the feed or utensils used therein.

Rule XV.—Persons licensed to milk cows on any dairy farm shall during milking wear a clean white apron or similar garment kept solely for that purpose and washed and boiled daily. Milk-ers shall lubricate their fingers slightly with vaseline or butter before beginning to milk. They shall not use the milk of the cow for that purpose. The first gush of milk from teat shall be thrown upon the ground. The udder and flanks of every cow shall be carded at least once daily; the udder shall be wiped over with a moist cloth just before milking. The floor of the milking room shall be moistened just before milking and milking rooms shall be kept as free as possible from dust and manure. Hay and straw shall not be brought in or fed just before or during milking. Storage cans for milk shall not be kept in the room where cows are milked nor shall milk be poured from one vessel into another in such rooms. Milk shall be cooled as quickly as possibly to near the freezing point and kept there until delivered to consumer.

Rule XVI.—Milkmen using antiseptics of any kind and those feeding rotten ensilage, distillery mash and such unwholesome foods shall be refused license, as well as all who refuse to abide by the rules. A record of each dairy supplying the town shall be kept in a public place, open to the inspection of the citizens of such town.

Rule XVII.—No cow reacting to tuberculin or showing any clinical evidence of tuberculosis shall be permitted to remain in any licensed dairy herd. When dairy cows are stabled for six or more

hours daily each animal shall have a separate stall or alcove so arranged that the adjoining cows cannot lick each other or blow into each other's faces. Each animal should have a minimum of 1000 cubic feet of space. Cow stables shall be as well lighted as possible, efficiently ventilated and kept free from foul odors and other evidence of uncleanness.

Tuberculin and its uses.

"Tuberculin" is the name of a glycerine extract of the tubercular bacillus in which all living bacteria have been killed and removed by filtration. It is one of Koch's discoveries and was originally in 1890 announced by him as a cure for tuberculosis. As a curative agent tuberculin proved of little or no value. As an indicator for the presence of the disease in even an incipient form it has proved of very great value. The precise nature of the reaction is not understood. In practice when thirty to forty cubic centimeters of the standard glycerine extract are injected into a suspected animal, if the animal is tuberculous in the slightest degree there will be a steady rise of temperature for eight to ten hours, reaching at length 104 degrees F. The natural temperature of cows is 102.2 degrees F. The average error of this method of diagnosis is about 3.3 per cent. Cases of tuberculosis which show no clinical symptoms are easily discovered by this method. Tuberculin is itself wholly innocuous to the health of animals. It does not contain the bacteria but only a chemical extract of bacteria very largely diluted with glycerine and beef broth. In preparing tuberculin a broth is first made of veal, peptone, glycerine and salt. This after being suitably sterilized is inoculated with a living culture of the bacillus and kept at a constant tempera-

ture of 37.5 degrees C. (about ninety-nine degrees F.) for six weeks. The culture thus obtained is then sterilized in autoclave at 115 degrees C. (239 degrees F.), filtered through paper and finally through porcelain. It is then evaporated to one-tenth its former bulk, and a little of two per cent. carbolic acid is added. It keeps well in tightly stoppered bottles kept in a cool dark place. This is the standard tuberculin used chiefly in testing cattle. There are many newer forms of so-called "purified tuberculin," some of them devised by Koch himself. These new forms are attempts to increase the curative power of the substance. So far they are only in the experimental stage and not very promising.

Method of examining milk and sputum for the tubercular bacillus.

Bacillus tuberculosis is one of the very few bacteria that can be satisfactorily identified by microscopical methods alone. The unique behavior of this bacillus to stains and decolorizers used in microscopic work make the identification comparatively easy, rapid and certain. A sample of yellowish sputum is rubbed or teased on a clean cover glass. The film thus obtained is dried in the air and fixed to the glass by passing through a flame. It is then boiled for three or four minutes in Zeihl's carbol-fuchsin, decolorized in twenty per cent. sulphuric acid, counter-stained with methylene blue and mounted in balsam or examined in water.

In case of suspected milk, urine or other fluid, the fluid is diluted with an equal volume of distilled water and centrifugalized for ten minutes. The supernatant fluid is then carefully decanted and a film made from the deposit in the way above explained. In testing urine in order to avoid contamination with the

smegma bacillus it is best to draw the urine with a sterile catheter. If milk has to be kept for over five hours before examining it should receive two per cent. of glacial carbolie acid.

Where it is desired to test the virulence of a pure culture of the bacillus or of suspected milk the guinea-pig is the animal usually chosen, a cubic centimeter or so of the suspected fluid is injected subcutaneously—the location being immaterial.

This bacillus is one of the most difficult of all known germs to cultivate *in vitro*. As cultivation is really unnecessary for a diagnosis it is rarely attempted. The best way to secure a pure virulent culture is to first inoculate a guinea-pig and after six weeks kill the animal, and with a portion of the spleen inoculate culture tubes or solidified blood serum.

Review of Diseases for October, 1901.

EIGHTY-NINE COUNTIES REPORTING.

Ninety-four counties have Superintendents of Health.

Except in the case of the more contagious and dangerous diseases the Superintendent has, as a rule, to rely upon his own information alone, since few physicians can be induced to report cases of non-contagious diseases to him.

Where the number of cases is not given or the prevalence of a disease otherwise indicated, its mere presence in the county is to be understood as reported.

For the month of October the following diseases have been reported from the counties named:

MEASLES.—Burke, 2 cases; Cleveland, a few; McDowell; Polk, 1; Randolph, epidemic; Wake, 1; Watauga, a few; Yancey, a few—8 counties.

WHOOPING-COUGH.—Beaufort, 2; Ber-

tie, many; Bladen, a few; Caldwell, 10; Cumberland, a few; Currituck, a few; Durham; Harnett, a few; Mecklenburg, 12; Nash, 11, New Hanover, 3; Orange, several; Person; Polk, 1; Randolph, epidemic; Rockingham, a few; Rowan, 2; Rutherford, a few; Scotland, 6; Union, epidemic; Vance, a few; Wake, 15—22 counties.

SCARLET FEVER.—Alexander, 25; Ashe, 4; Buncombe, 35; Cabarrus, 4; Caldwell, 10; Caswell, several; Catawba, 3; Cherokee; Clay, a few; Davidson, 1; Durham; Edgecombe, 1; Forsyth; Franklin, 1; Granville, 2; Guilford, 6; Halifax; Harnett, a few; Haywood, 1; Henderson, 6; Iredell, in all parts; Jackson, 50; Madison, in all parts; Martin, 3; Mecklenburg, 20; New Hanover, 4; Polk, 4; Randolph, 10; Rockingham, a few; Rutherford, several; Stanly, several; Swain, 6; Union, 3; Wake, 5; Watauga; Yadkin, 2; Yancey—37 counties.

DIPHTHERIA.—Brunswick, many; Cumberland, a few; Craven, 2; Gaston, a few; Granville, 3; Guilford, 4; Iredell, 4; Lincoln, 3; New Hanover, 2; Pender, 3; Randolph, 2; Rockingham; Rowan, 1; Stanly; Union, 3; Wake, 2; Watauga, a few; Wilkes, 6; Yadkin, 1—19 counties.

TYPHOID FEVER.—Alexander, 30; Anson, 3; Ashe, 8; Brunswick, 1; Buncombe; Cabarrus, 8; Caldwell, 5; Caswell, 9; Catawba, 3; Chatham; Chowan, 3; Clay, a few; Cleveland, a few; Columbus, several; Craven, 6; Cumberland, a few; Currituck, a few; Duplin, 3; Gates, 3; Granville, 2; Greene, 15; Guilford, 2; Halifax; Harnett, many; Haywood, 3; Henderson, 6; Iredell, many; Jackson, 2; Johnston, some in all parts; Jones, 2; McDowell; Macon, 2; Martin, 1; Mecklenburg; Nash, 11; New Hanover, 2; Northampton, 6; Onslow, 2; Orange, 1;

Pasquotank, 1; Pender, 8; Perquimans, 1; Person; Polk, 2; Randolph, 24; Richmond, 12; Robeson, many; Rockingham; Rowan, 6; Sampson, a few; Scotland, 12; Stanly; Stokes, 1; Surry, 12; Swain, 3; Union, several; Vance, a few in all parts; Wake, 20; Warren, 8; Wayne, a few; Wilkes, 1; Yadkin, 2; Yancey, a few—63 counties.

MALARIAL FEVER.—Alamance, general; Beaufort; Bertie, general; Bladen; Brunswick; Chatham; Cherokee, Chowan, Currituck, Dare, general; Duplin; Durham; Franklin; Gaston, a few; Gates; Granville; Greene, general; Halifax; Hyde, Johnston, Jones, Lenoir, general; Lincoln; Martin, general; Nash; Northampton; Onslow; Orange, general; Pasquotank; Perquimans; Person; Randolph; Robeson; Sampson, general; Warren, in many parts; Washington, general; Wayne; Wilson, general—38 counties.

MALARIAL FEVER, PERNICIOUS.—Beaufort, 2; Nash, 1; Randolph, 2; Washington, 2; Wayne, 3 or 4.

MALARIAL FEVER, HEMORRHAGIC.—Bertie, 1; Chowan, 2; Craven, 2; Dare, 1; Franklin, 1; Gates, 1; Northampton, 8; Onslow, 4; Perquimans, 3—9 counties.

INFLUENZA.—Stokes, in all parts; Union, in all parts.

MUMPS.—Swain.

PNEUMONIA.—Cherokee; Mitchell.

VARICELLA.—Swain.

SMALL-POX.—Cabarrus, 24; Duplin, 5; Greene, 1; Guilford, 1; Henderson, 7; Mecklenburg, 11; Rockingham, 19; Stokes, 1; Wayne, 15 or 16—9 counties.

CHOLERA, IN CHICKENS.—Chatham, Graham.

CHOLERA, IN HOGS.—Chatham, Currituck, Lenoir, Northampton, Onslow, Pender, Randolph and Robeson—8 counties.

INFLUENZA, IN HORSES.—New Hanover.

STAGGERS, IN HORSES.—Hyde and Martin.

No diseases reported from Carteret and Davie.

No reports received from Alleghany, Hertford, Montgomery, Moore and Pitt.

Summary of Mortuary Reports for October, 1901.

(TWENTY-FOUR TOWNS).

	White.	Col'd.	Total.
Aggregate population.....	85,220	55,200	140,420
Aggregate deaths.....	116	114	230
Representing temporary annual death rate per 1,000.....	16.3	24.8	19.6
<i>Causes of Death.</i>			
Typhoid fever.....	12	9	21
Scarlet fever.....	4	0	4
Malarial fever.....	11	7	18
Diphtheria.....	4	2	6
Whooping-cough..	1	1	2
Pneumonia.....	2	2	4
Consumption.....	8	17	25
Brain diseases.....	14	8	22
Heart diseases.....	6	8	14
Neurotic diseases...	2	4	6
Diarrhœal diseases	9	16	25
All other diseases..	40	37	77
Accident.....	3	2	5
Suicide.....	0	1	1
	<hr/>	<hr/>	<hr/>
	116	114	230
Deaths under five years.....	41	42	83
Still-born.....	5	12	17

Mortuary Report for October, 1901.

TOWNS AND REPORTERS.	RACES.	POPULATION.		TEMPORARY ANNUAL DEATH RATE PER 1,000.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrhoeal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	TOTAL DEATHS.		Deaths under five years.	Still-born.
		By Races.	Total.	By Races.	Total.																	By Races.	By Towns.		
Asheville	W.	10,000		23.2																		21	32	6	1
Dr. C. V. Reynolds.	C.	4,800	14,800	27.5	25.9	4	3		1			1	3	1	3			6	1			11	32	3	6
Charlotte	W.	11,000		6.5		1	1															6	19	3	1
Dr. F. O. Hawley.	C.	7,200	18,200	21.7	12.5			2	1					2		1	7					13	19	7	1
Durham	W.	10,000		10.8					1		1		2		1	1	3					9	16	3	
Dr. N. M. Johnson.	C.	5,000	*15,000	16.8	12.8	1			1			1	1	1	1		2					7	16	4	
Fayetteville	W.	2,500		9.6																		2	7		
Dr. John D. MacRae.	C.	2,300	4,800	20.8	15.0							3					1					4	6		
Goldshoro	W.	3,400		38.8				3					1	1			2					11	15	8	
Geo. E. Hood, Mayor.	C.	2,600	6,000	18.5	30.0							1	1				1		1			4			
Henderson	W.	2,300		5.2		1																1	2		
Dr. F. R. Harris.	C.	1,500	3,800	8.0	6.3												1					1			
Laurinburg	W.	900		0.0																		0	0		
Dr. A. W. Hamer.	C.	600	1,500	0.0	0.0																	0			1
Lenoir	W.	1,200		20.0		1							1									2	2		
Dr. A. A. Kent.	C.	300	1,500	0.0	16.0																	0			
Marion	W.	800		0.0																		0	0		
Dr. B. A. Cheek.	C.	350	1,150	0.0	0.0																	0			
Monroe	W.	1,850		0.0																		0	0		
Dr. J. M. Blair.	C.	600	2,450	0.0	0.0																	0			
Oxford	W.	1,200		0.0									3				1					0	1		
Dr. S. D. Booth.	C.	900	2,100	13.3	5.7																	1			
Raleigh	W.	8,000		24.0		2	2					1	3				2	6				16	30	3	3
T. P. Sale, Clerk B. H.	C.	5,800	13,800	28.9	26.1	1	1					1	4	1			1	5				14	30	7	3
Reidsville	W.	2,900		4.1									1					1				1	2		
Jas. T. Smith, Cy. Cl.	C.	1,300	4,200	9.2	5.7																	1			1
Rockingham	W.	1,500		8.0														1				1	2	1	
Dr. Wm. P. S. Webb.	C.	500	2,000	24.0	12.0								1									1			
Rocky Mount	W.	1,500		16.0				1										1				2	3	1	
Dr. G. L. Wimberley, Jr.	C.	1,600	3,100	7.5	11.6									1								1			
Salern	W.	3,300		18.2		1						1					3					5	5	1	1
J. A. Vance, Mayor.	C.	350	3,650	0.0	16.4																	0			
Salisbury	W.	3,900		9.2								1	2									3	4		
Dr. W. W. McKenzie.	C.	2,500	6,400	4.8	7.5								1									1			
Smithfield	W.	620		38.7		1											1					2	3	1	
J. C. Bingham, Mayor.	C.	450	1,070	26.7	33.6								1									1			
Southport	W.	900		66.7				1					2	1				1				5	5	2	
Dr. D. I. Watson.	C.	500	1,400	0.0	42.8																	0			
Tarboro	W.	2,000		12.0									1		1							2	4		
Dr. L. L. Staton.	C.	500	2,500	48.0	19.2												2					2			
Washington	W.	2,300		16.2			2										1					3	12	3	
Dr. Jno. G. Blount.	C.	2,600	4,900	41.5	29.4								3			5	1					9		3	
Weldon	W.	700		51.4			1												2			3	3		
J. T. Gooch, Mayor.	C.	750	1,450	0.0	24.8																	0			
Wilmington	W.	10,600		21.5		1	3	1				1	1	2		3	7					19	55	6	
Dr. Chas. T. Harper.	C.	10,500	21,100	41.1	31.3	2	4	1				3	1	3	6	14	2					36		18	
Wilson	W.	1,850		13.0									1				1					2	9	3	
Dr. W. S. Anderson.	C.	1,700	3,550	49.4	30.4							3					2	2				7			

N. B.—The reporters for the cities and towns printed in **Black Type** have signed this certificate: "I hereby certify that this report gives the *whole* number of deaths occurring within the corporate limits during the above month." The total populations are taken from the census report for 1900, but the division into races is estimated, as those figures have not been given out.

*This is the estimate of the reporter since the extension of the city limits.

County Superintendents of Health.

Alamance	Dr. H. R. Moore.	Jones.....	Dr. S. E. Koonce.
Alexander	Dr. C. J. Carson.	Lenoir	Dr. C. L. Pridgen.
Alleghany	Dr. B. C. Waddell.	Lincoln	Dr. T. F. Costner.
Anson	Dr. J. H. Bennett.	McDowell	Dr. B. A. Cheek.
Ashe.....	Dr. J. W. Colvard.	Macon	Dr. F. L. Siler.
Beaufort	Dr. Jno. G. Blount.	Madison	Dr. Jas. K. Hardwicke.
Bertie	Dr. H. V. Dunstan.	Martin.....	Dr. W. H. Harrell.
Bladen.....	Dr. Newton Robinson.	Mecklenburg.....	Dr. C. S. McLaughlin
Brunswick	Dr. J. A. McNeill.	Mitchell.....	Dr. V. R. Butt.
Buncombe	Dr. E. B. Glenn.	Montgomery	Dr. M. P. Blair.
Burke.....	Dr. J. L. Laxton.	Moore.....	Dr. Gilbert McLeod.
Cabarrus.....	Dr. R. S. Young.	Nash	Dr. J. P. Battle.
Caldwell	Dr. A. A. Kent.	New Hanover	Dr. W. D. McMillan.
Camden.....		Northampton.....	Dr. H. W. Lewis.
Carteret	Dr. F. M. Clark.	Onslow.....	Dr. E. L. Cox.
Caswell	Dr. S. A. Malloy.	Orange.....	Dr. D. C. Parris.
Catawba	Dr. Geo. H. West.	Pamlico.....	
Chattham.....	Dr. H. T. Chapin	Pasquotank	Dr. J. E. Wood.
Cherokee.....	Dr. J. W. Patton.	Pender.....	Dr. J. R. Thomson.
Chowan.....	Dr. T. J. Hoskins.	Perquimans	Dr. C. C. Winslow.
Clay	Dr. J. O. Nichols.	Person	Dr. J. A. Wise.
Cleveland	Dr. B. H. Palmer.	Pitt.....	Dr. C. O'H. Laughing-
Columbus.....	Dr. I. Jackson.		house.
Craven.....	Dr. N. H. Street.	Polk	Dr. Earle Grady.
Cumberland.....	Dr. Jno. D. McRae.	Randolph	Dr. S. A. Henley.
Currituck	Dr. H. M. Shaw.	Richmond.....	Dr. Wm. P. Webb.
Dare	Dr. W. B. Fearing.	Robeson	Dr. H. T. Pope.
Davidson.....	Dr. Joel Hill.	Rockingham	Dr. Sam Ellington.
Davie	Dr. James McGuire.	Rowan.....	Dr. W. L. Crump.
Duplin	Dr. O. F. Smith.	Rutherford.....	Dr. T. B. Twitty.
Durham	Dr. N. M. Johnson.	Sampson	Dr. R. E. Lee.
Edgecombe	Dr. L. L. Staton.	Scotland	Dr. A. W. Hamer.
Forsyth.....	Dr. John Bynum.	Stanly.....	Dr. V. A. Whitley.
Franklin	Dr. E. S. Foster.	Stokes	Dr. W. V. McCaules.
Gaston.....	Dr. J. H. Jenkins.	Surry	Dr. John R. Woltz.
Gates.....	Dr. W. O. P. Lee.	Swain.....	Dr. J. A. Cooper.
Graham	Dr. R. J. Orr.	Transylvania	Dr. C. W. Hunt.
Granville	Dr. S. D. Booth.	Tyrrell.....	
Greene.....	Dr. Joseph E. Grimsley.	Union	Dr. J. E. Ashcraft.
Guilford.....	Dr. Edmund Harrison.	Vance	Dr. Goode Cheatham.
Halifax	Dr. I. E. Green.	Wake.....	Dr. J. J. L. McCullers.
Harnett.....	Dr. O. L. Denning.	Warren.....	Dr. A. S. Pendleton.
Haywood	Dr. S. B. Medford.	Washington	Dr. W. H. Ward.
Henderson	Dr. J. G. Waldrop.	Watauga.....	Dr. T. C. Blackburn.
Hertford	Dr. J. H. Mitchell.	Wayne.....	Dr. Williams Spicer.
Hyde.....	Dr. E. H. Jones.	Wilkes.....	Dr. W. P. Horton.
Iredell	Dr. Henry F. Long.	Wilson.....	Dr. W. S. Anderson.
Jackson.....	Dr. Wm. Self.	Yadkin	Dr. S. L. Russell.
Johnston	Dr. L. D. Wharton.	Yancey	Dr. J. L. Ray.

BULLETIN

OF THE

North Carolina Board of Health.

Published Monthly at the Office of the Secretary of the Board, Raleigh, N. C.

GEO. G. THOMAS, M. D., *Pres.*, Wilmington.
S. WESTRAY BATTLE, M. D., Asheville.
HENRY W. LEWIS, M. D., Jackson.
J. L. NICHOLSON, M. D., Richlands.

W. P. IVEY, M. D., Lenoir.
FRANCIS DUFFY, M. D., New Bern.
W. H. WHITEHEAD, M. D., Rocky Mt.
J. L. LUDLOW, C. E., Winston.

RICHARD H. LEWIS, M. D., *Secretary and Treasurer*, Raleigh.

VOL. XVI.

DECEMBER, 1901.

No. 9.

Biological Analyses.

It is with much gratification that we announce to our medical readers and through them to the people of the State, who are the real beneficiaries, that the State Board of Agriculture at its annual meeting on the 4th inst. continued the privilege granted a year ago of having biological analyses bearing on the public health made in the laboratory of the Department. We appeared by request before the honorable Board, and the short statement made of the importance and value of the work done during the past year, re-enforced by a formidable bundle of letters on the subject from health officers, physicians, mayors and others, of which three samples were read, was given a sympathetic hearing. Mr. Gerald McCarthy, to whose labors we are so much indebted, was re-elected Bi-

ologist. In this connection it is proper to say that Mr. McCarthy has no assistance, and that in consequence a certain amount of "red tape" is necessary in order to properly regulate the work in a discriminating manner. We have therefore adopted the following rules, from which there will be absolutely no variation, and we bespeak for them a very careful reading:

RULE 1. *Applications for bacteriological examinations of drinking water, of sputum and of blood in doubtful cases of fever must be made to the Secretary of the State Board of Health. The reasons for suspecting drinking water as a cause of disease must be given and the sample of the same must be taken and packed by a PHYSICIAN in strict accordance with the directions furnished.*

RULE 2. *Specimens from the throats of suspected diphtheria cases must be*

taken on the sterilized swabs belonging to the State Board of Health, a supply of which will be deposited with the County Superintendent of Health, or the medical health officer of cities and towns having such an official, and mailed direct to the Biologist. Reports of these examinations will be sent by telegraph at the expense of the applicant. Reports on specimens sent for determining the presence or absence of the bacillus diphtheriae after apparent recovery in relation to quarantine will be sent by mail unless otherwise requested.

Owing to the late delivery of mails from three directions, often after office hours, we would suggest the advisability of using a special delivery stamp on diphtheria specimens sent for diagnosis.

Vaccination and Tetanus.

The occurrence last month in Camden, N. J., of eleven cases of tetanus in persons who had been vaccinated has created widespread interest and alarm—especially on the part of those who are seeking reasons for escaping vaccination. No one should be permitted to escape vaccination, and in order to allay the fears of the timid and as far as possible to hobble the feet of the kickers, we print below the report on the subject of the Camden Board of Health, showing conclusively that the tetanus was not introduced through the vaccine virus. At the same time this most important experience, as well as the production of tetanus by the use of infected diphtheria antitoxin in St. Louis recently, must temporarily impair the usefulness of the most powerful agency in preventive and one of the most reliable in curative

medicine. The ultimate effect, however, will be good for the greatest care in the performance of vaccination and in the subsequent protection of the vesicle sure to follow will save many a sore arm, and all antitoxin made by reputable establishments will hereafter be tested for the tetanus bacillus before being sent out.

The following is the report referred to:

OFFICIAL REPORT OF THE CAMDEN BOARD OF HEALTH CONCERNING THE CASES OF TETANUS WHICH OCCURRED IN PATIENTS WHO HAD BEEN VACCINATED.

CAMDEN, N. J., Nov. 29, 1901.

GENTLEMEN:—Your Committee appointed to investigate the matter of tetanus prevalent in our city, said to be due to vaccination or virus used, would most respectfully submit the following report:

1. Samples of all the different makes of vaccine employed in Camden have been tested for tetanus germs by the State Bacteriologist of New Jersey, and have been found pure and entirely free from tetanus germs; hence, tetanus could not have been caused by the virus employed. [See Report of Dr. Mitchell, Secretary of New Jersey State Board of Health, page 6.]

2. The history of each case of tetanus has been carefully collected from the attending physician, and in every instance vaccination was practiced in a correct and cleanly manner; the infection of tetanus resulting from neglect on the part of the patients to present themselves to the attending physicians, so that their vaccination could receive proper attention.

3. One case of tetanus has occurred from gun-shot wound, during the same period, in a boy who had not been vac-

inated, proving that the tetanus germs were in the atmosphere. [Case 8, page 3.]

4. Indisputable evidence of the fact that the tetanus germs were not introduced at the time of vaccination is that acute tetanus occurs in from 5 to 9 days after the introduction of the germs, whereas in every case acute tetanus occurred in from three to four weeks after the vaccination. If the virus had been contaminated, tetanus would have ensued within nine days after vaccination. Tetanus developed irrespective of vaccine used.

5. Further proof of the purity of the virus exists in the reports of the physicians in Cooper Hospital, who tested on animals samples of all makes of vaccine employed in Camden. If the virus had been contaminated, the animals would have developed tetanus because of their extreme susceptibility to this disease. [See Animal Experiments, Cooper Hospital, page 6.]

6. During the past five weeks there have been vaccinated in Philadelphia a very large number of people with the same virus as employed in Camden. In not one of these cases did tetanus occur.

7. The tetanus cases in Camden are to be explained upon atmospheric and telluric conditions which have prevailed in Camden during the past six weeks. There has been a long period of dry weather with high winds, so that tetanus germs, which have their normal habitat in the earth dust, dirt of stables, etc., have been constantly distributed in the atmosphere. It is noticeable in all the cases, after careful examination as to the cause, that the wound had been exposed by the scab being knocked off or

removed, or else the arm had been injured and infection resulted; frequently children scratched the vaccinated area with their dirty fingers and nails and infected the wound.

8. That vaccination should be regarded as a surgical operation and should be performed in an aseptic or clean manner, and in every instance the physician should be consulted for advice if any unusual inflammation should develop.

9. It is the unanimous opinion of the Board of Health, as well as of their committee of experts, that, inasmuch as vaccination is harmless, it should be insisted upon by physicians as an absolutely necessary procedure for the prevention of small-pox. Tetanus, or any other infection, can never occur if the vaccination is properly protected from contact with the atmosphere or with soiled clothing, bandages, etc.

HENRY H. DAVIS, M. D., Prest.,

JOEL W. FITHIAN, M. D.,

S. G. BUSHEY, M. D.,

Committee Board of Health.

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RECORD OF CASES.

Case No. 1.—Wm. J. Bauer, aged 7 years; color, white; residence, Camden, N. J.; vaccinated October 12, 1901, with glycerinized virus, marked good until December 26, 1901; aseptic precautions used before vaccination; tetanus symptoms appeared on November 1, 1901; at this time the primary scab from vaccination had been lost off during play, the wound presented a healthy and clean condition, no discharge; the case rapidly grew worse, developing typical tetanus, and died November 3, 1901.

In connection with this case, however, an important fact presents itself: This boy's brother was vaccinated at the same time and with virus from the same tube, having a successful vaccination, no bad

results, running a regular course—the boy at this time attending school.

Case No. 2.—Wm. Brewer, aged 8 years; color, white; residence, Camden, N. J.; vaccinated October 14th, with glycerinized virus, marked good until December 26, 1901; aseptic precautions used before vaccination. Tetanic symptoms presented themselves November 4, 1901; at the time the arm was swollen, the wound presenting a dry and black appearance, but emitting a bad odor; the wound was curetted and treated; tetanus antitoxin was used with other proper remedies, and the attending physician says he is at this time steadily improving.

Case No. 3.—Anna M. Warrington, aged 11 years, 2 months; color, white; residence, Camden, N. J.; vaccinated October 19th, used glycerinized virus, capillary tubes, marked good until December 10, 1901; aseptic precautions used before vaccination. Tetanic symptoms occurred on November 6, 1901, continually increased in violence, and patient died November 8, 1901.

Case No. 4.—Frank Cavallo, age 5 years; color, white; residence, Camden, N. J.; vaccinated October 25, 1901, with glycerinized virus, capillary tubes; aseptic precautions used before vaccination. The physician attending first saw the case at his office in the evening of November 8th, complaining of a stiffness of the cheek muscles; was called to see the boy at his home at 5 o'clock A. M., November 9th, when a typical case of tetanus existed, the patient dying at 3 P. M. same day. The boy's home was within fifteen feet of a stable, not very cleanly kept, where he played much of his time.

In this case it is of importance also to know that a brother, three years younger, was vaccinated at the same time from the same virus, who had a successful vaccination, no bad results.

Case No. 5.—Lillian E. Carty, aged 16 years; color, white; residence, Camden, N. J.; vaccinated October 14, 1901, with dry virus, ivory points, virus marked good until December 10, 1901; aseptic precautions used before vaccination. Tetanic symptoms appeared November 8, 1901; the arm was inflamed—

an open sore, irregular in shape—and the shield worn was adhered to the wound from the excessive discharge. The patient seemed to improve somewhat for a time, but later on convulsions ensued and she died November 15, 1901.

Case No. 6.—Thomas B. Hazelton, aged 11; color, white; residence, Camden, N. J.; vaccinated October 23, 1901; glycerinized virus, ivory points, marked good until December 10, 1901; aseptic precautions used before vaccination. Tetanic symptoms appeared in mild form November 11, 1901; on morning of November 12th convulsions set in, patient died 4.15 A. M., November 13, 1901.

Case No. 7.—Anna B. Cochran, age 9 years, 7 months; color, white; residence, Camden, N. J.; vaccinated October 21st, glycerinized virus, capillary tubes, virus marked good until December 10, 1901; aseptic precautions used before vaccination. Tetanic symptoms appeared November 13th; continued to grow rapidly worse; died November 14, 1901.

Case No. 8.—Elwood Simpson, aged 13 years; color, white; residence, houseboat, Mantua, N. J.; received gun-shot wound on left foot on afternoon of November 8, 1901, from a small air-rifle loaded with small shot. The family physician at Mantua was called in, who dressed the wound. On Saturday—the following day—the physician reporting the case was called in and attended the boy until Monday, the 11th, when he was sent to the Cooper Hospital for treatment, as the sanitary conditions were better and he would be much better treated. He remained at the hospital until November 14, 1901, when he returned home. Friday morning the doctor was again called to see the boy, and at once diagnosed a case of tetanus, and from that moment he grew rapidly worse, convulsions ensuing and continuing until he died Saturday noon, November, 16, 1901. This case was not vaccinated.

Case No. 9.—Mamie Winters, age 8 years; color, white; residence, Camden, N. J.; vaccinated October 26th, with glycerinized virus in capillary tubes, marked good until January 5, 1902; aseptic precautions used before vaccination. The family physician was called in

to see her on November 15, 1901; tetanic symptoms presenting well marked; at this time all local symptoms had disappeared from the arm; the patient is still alive and improving.

Case No. 10.—Georgiana Overby, aged 9 years; colored; residence, Camden, N. J.; vaccinated October 26th, at City Dispensary, with glycerinized virus, ivory points; aseptic precautions used before vaccinating. The physician was first called in November 22d, and was told the patient had been feeling bad for three or four days; the vaccine sore on arm still open and discharging somewhat, but had a healthy appearance; there was open sore on inside and corner of lower lip—appropriate remedies were used. At this time, while the case seemed a mild one, the symptoms of tetanus were well marked; the patient seemed to yield for a time to the usual treatment in these cases, but on Tuesday morning convulsions set in and the child died about 11 A. M.

It is of interest to note in this case also her brother was vaccinated at same time, place and with same kind of virus; he has a good scar, perfectly well at this time.

Case No. 11.—Ada Heath, age 13; color, white; residence, Camden, N. J.; vaccinated about three weeks from the date of the attack of tetanus, on November 25th. The case was a typical one and violent from the onset, the patient dying November 26th.

In all the above cases, the physicians' statements were taken; and, while the details regarding the treatment are not included in this report, the facts to determine, if any, or all of them, depended upon vaccination, or the vaccine used, as the cause of the tetanus, which had been given publicity North, South, East and West. In our own city, our citizens—especially those vaccinated—were in fear and trembling lest they should be the next victim, compelling vaccination, for the time, at least, to cease.

After the examination of the physi-

cians, we concluded to endeavor to collect some of the lymph used by the physicians vaccinating the cases in question.

We are pleased to state that the samples were obtained from the same lot and package of the lymph with which the Bauer boy was vaccinated.

In the other cases we were not quite so fortunate; but we did obtain from the local druggists, where attending physicians had purchased the virus samples received at the same time from the different kinds used; so we now have practically obtained samples of the same virus used in all the cases requiring our attention, which seemed to us extremely fortunate. Many of these samples were obtained through and by the kind assistance of Dr. Hunt, Medical Inspector of the State Board of Health. However, to be sure and cover the ground thoroughly and be sure if the vaccine virus was at fault, more samples were purchased from our local dealers—of all kinds used in our city. After procuring them, they were tabulated properly and sent to Dr. H. O. Baldwin, at Princeton, N. J., who has charge of the Bacteriological Department, which is the authority for the State of New Jersey, and under the direction of the State Board of Health. After having done this, nothing further was left for us to do but wait until this report was received, which was on November 26, 1901.

While, in the opinion of this Committee, the virus employed in the cases was not responsible for the cases of tetanus, only so far as causing a sore, to a more or less degree, on the arm or place selected for vaccinating, it is much satisfaction to us to now know the bacteriolo-

gical investigation fully confirms this view, and without which our report would have been of no use to your Board, ourselves or the public.

Further, your Committee feel under obligations to Drs. Ross and Fretz, of the Cooper Hospital, whose experiments on the white rats have also assisted in proving that the vaccine used by us contained no tetanic germs. White rats, like guinea-pig, so much used in bacteriological experiments, are very susceptible to the tetanic poison or germs.

Statistics could be quoted galore as to the prevalence, at times, in certain localities and climates, of tetanus. The papers daily report cases of tetanus, and Camden is not the only place on the map unfortunate at this time.

Tetanus may follow from so slight a wound as a scratch of a pin on the hand, the pulling of teeth; even a new-born babe is not free, occurring as it does in persons of all ages. The great majority of the subjects are children and young adults. Atmospheric and climatic conditions, beyond question, act powerfully in, if not producing, at least favoring, the development of tetanus, says so eminent an authority as Pepper.

None of the authorities, of which we are aware, quote tetanus in connection with vaccination; and when taken into consideration the large number of our population vaccinated recently—at least twenty thousand—is it not marvellous that so few cases of tetanus exist if the virus of vaccination alone was the cause?

Statistics from the most eminent authorities and reliable sources tell us the only sure way to prevent the most loathsome and dreaded disease, small-pox, is by careful and successful vaccination.

For example, let us look at home, in our city, and see who is the most exposed to the disease. Is it not the doctor? Is it not him to whom the community appeals in their hour of trouble? And we venture an opinion that, of the one hundred physicians in our city, there are not more than one or two of the whole number but believe fully in vaccination, practice it upon themselves that they may be immune, and also upon their families. Let us ask our family doctors how many of them have had small-pox, though they have—more especially the older ones in practice—had more than one epidemic to fight. Get their views and expressions, which will be given honestly, and with pleasure, to their patients and friends. Let us ask those we know to be competent, sacrificing, God-fearing, for their advice and counsel—those whom we trust in our time of trouble and sickness. It is always well to begin at home, when we have information that is reliable, before going abroad. If, however, we feel we should like further enlightenment, we will look up statistics from such reliable sources as will leave us no room for doubt.

Your Committee venture this opinion: No greater boon has been offered mankind than vaccination, as suggested and proven by the immortal Jenner, and as quoted by Dr. James Nevins Hyde. If a modern traveller could find himself transported to the streets of the city of London as they appeared in the early part of the past century, it is probable that no peculiarities of architecture, dress or behavior would be to him so strikingly conspicuous as the number of pock-marked visages he would encounter among the people at every turn, and how different to-day.

Now that we have small-pox in our midst and around us, almost on every hand, let us use the best means that science has given us to prevent its spread and save to us those who are near and dear—not only their lives, but their features intact.

STATE HOUSE,

TRENTON, N. J., Nov. 26, 1901.

DR. H. H. DAVIS,

President Camden Board of Health.

Laboratory examinations of vaccine forwarded by your Board of Health show that no tetanus bacteria were present.

HENRY MITCHELL, M. D.,

Secretary New Jersey State Board of Health.

THE COOPER HOSPITAL,

CAMDEN, N. J., Nov. 26, 1901.

We report herewith the results of our experiments with the vaccine virus employed in Camden:

The virus was purchased from fifteen different pharmacies in Camden, and represented those brands of vaccine with which the patients who died of tetanus were vaccinated. All of these samples of vaccine were purchased in the open market without any person's knowledge that they were to be tested for the presence of tetanus germs.

These experiments were conducted in the Cooper Hospital, so that constant and careful observations could be made. White rats were selected because they are extremely susceptible to tetanus and because in these animals tetanus develops within twenty-four hours after infection. A large number of white rats were inoculated with all the samples of vaccine

and kept under observation for five days. Not a single one of the animals has, at any time since their inoculation, manifested the slightest symptoms of tetanus.

The results of our experiments enable us to state positively that the vaccine virus was pure and free from tetanus germs, thus proving that the cases of tetanus which occurred in Camden were not caused by the vaccine employed.

This investigation should remove all fear from the public mind and should encourage the people toward vaccination as a preventive to a disease which is imminent as an epidemic.

ALEXANDER SCANLAN ROSS, M. D.

S. EDWARD FRETZ, M. D.

PHILADELPHIA, PA., Nov. 27, 1901.

HENRY H. DAVIS, M. D.,

President Board of Health,

City Hall, Camden, N. J.

DEAR DOCTOR:—In answer to your inquiry of even date, I desire to state that our vaccine physicians have vaccinated nearly one hundred thousand persons in the past three months, and during the same period it is safe to state that at least 700,000 persons in Philadelphia have been vaccinated, without a single case of tetanus having been reported to this office. Yours truly,

J. LEWIS GOOD,

President Philadelphia Board of Health.

WAR DEPARTMENT,

SURGEON GENERAL'S OFFICE,

WASHINGTON, D. C., Nov. 23, 1901.

HENRY H. DAVIS, M. D.,

President Board of Health,

Camden, N. J.

SIR:—Replying to yours of November 20, 1901, relative to statistics concerning tetanus after vaccination, and the effi-

ciency of vaccination in preventing small-pox, I am directed by the Surgeon General to refer you to the report of the Superior Board of Health of Porto Rico, Major J. Van R. Hoff, Surgeon, U. S. Army, Chairman, period '98-'00, page 117, in which the following statement is made: "The average annual number of deaths from small-pox for the past ten years was 621; the greatest number, 2,362, occurring in 1900, and the least, 11, in 1893. In 1899 there were about 50 per cent. less deaths than in any of the three years preceding. This decrease was due to the general vaccination of the island, which was concluded June 30 of that year; 860,000 vaccinations were performed under the direction of the chief surgeon of the department during the four months preceding this date. All the deaths reported in 1899 from small-pox, except one, occurred prior to the day on which the work was concluded. At the rate of 242 for the first six months the annual deaths would have been practically the same as in the preceding three years. During the seven months covered by these statistics but one death has occurred from this cause."

It is stated by Major Hoff that subsequent to the completion of the general vaccination of the Porto Rican population on June 30, 1899, there have occurred, down to the present time, but three deaths from small-pox in Porto Rico—the average annual death rate from this disease being reduced from 621 to less than 1.5, with an apparent saving of 1,239 lives since the date mentioned. No epidemics of variola have occurred since that time in Porto Rico. A slight outbreak of varioloid occurred in the city

of Ponce, but it was attended with no deaths and quickly subsided.

Although there were over 860,000 vaccinations performed on a susceptible and generally unvaccinated Porto Rican population, only one death occurred which could be attributed to vaccination. This was due to tetanus, and occurred in a child. Tetanus is, however, an extremely common and fatal disease in Porto Rico, causing no less than 818 deaths on the island during the seven months, October 1st to May 1st, 1899-1900, or 3.41 per cent. of the total mortality. The occurrence of the case of tetanus following vaccination was undoubtedly due to a secondary infection from an outside source with the widely-distributed tetanus germ.

A second instance illustrating the efficiency of vaccination is given in the report of the Surgeon General of the Army for 1899, page 245, where a brief description is given of the stamping out of an epidemic of small-pox in the district of Holguin, Cuba. In this epidemic, 1,185 cases of small-pox were collected into isolation hospitals by the army surgeons in charge. General vaccination of the Cuban population was practiced and the epidemic was promptly brought under control. It is of interest to note that not a single case of small-pox occurred in the carefully-vaccinated regiment of United States troops which furnished the guards for the lazarettos, performed the work of disinfection of infected buildings and in other ways were constantly exposed to the danger of contracting small-pox.

Respectfully,

EDWARD L. MUNSON,

Captain, Assistant Surgeon, U. S. A.

THE TRUTH ABOUT VACCINATION.

Dr. Bizzozziro, in a recent lecture delivered at Rome, recalled strikingly to his audience the success of vaccination in Germany. He said: "Germany stands alone in fulfilling, in a great measure, the demands of hygiene, having in consequence of the calamitous small-pox epidemic of 1870-71 enacted the law of 1874, which makes vaccination obligatory in the first year of life, and revaccination obligatory at the tenth year. What was the result? With a population of 50,000,000, having in 1871 lost 143,000 lives by small-pox, she found, by the law of 1874, the mortality diminished so rapidly that to-day the disease numbers only 116 victims a year.

"These cases, moreover, occur almost exclusively in towns on her frontier. If it were true that a good vaccination does not protect from small-pox, we ought to find in small-pox epidemics that the disease diffuses itself in the well-vaccinated no less than in non-vaccinated countries. But it is not so. In 1870-71, during the Franco-German war the two peoples interpenetrated each other, the German having its civil population vaccinated optionally, while the French (population and army alike) were vaccinated perfunctorily. Both were attacked by small-pox.

"The French army numbered 23,000 deaths by it, while the German army had only 278; and in the same tent, breathing the same air, the French wounded were heavily visited by the disease, while the German wounded, having been vaccinated, had not a single case."

*Supplement Public Health Reports, U. S. Marine Hospital—Vol. 14, page 7, Washington, D. C., January 6, 1899—No. 1.

Review of Diseases for November, 1901.

EIGHTY-NINE COUNTIES REPORTING.

Ninety-four counties have Superintendents of Health.

Except in the case of the more contagious and dangerous diseases the Superintendent has, as a rule, to rely upon his own information alone, since few physicians can be induced to report cases of non-contagious diseases to him.

Where the number of cases is not given or the prevalence of a disease otherwise indicated, its mere presence in the county is to be understood as reported.

For the month of November the following diseases have been reported from the counties named:

MEASLES.—Brunswick, 1 case; Cleveland, a few; Polk, 1; Stanly, some; Yancey, a few.

WHOOPING-COUGH.—Bertie, many; Caswell, several; Dare, 9; Durham, several; Harnett, a few; Mecklenburg; Orange, a few; Pasquotank, 7; Person; Polk, 1; Richmond, a few; Rockingham; Rutherford, a few; Union, epidemic; Vance, a few; Wake, 23—16 counties.

SCARLET FEVER.—Ashe, 2; Buncombe, 3; Cabarrus, 6; Caswell, 5; Catawba, 12; Durham, 20; Gaston, many; Granville, 1; Guilford, 4; Halifax, 3; Henderson, 7; Hertford, 2; Jackson, 50; Macon, several; Madison, 10; New Hanover, 3; Polk, 1; Rowan, 1; Scotland, 1; Stanly; Swain, 5; Union, 4; Wake, 3; Watauga, 20; Wayne, 3 or 4; Yancey, several—26 counties.

DIPHTHERIA.—Brunswick, many; Buncombe, 1; Cabarrus, 2; Chowan, 1; Cleveland, a few; Craven, 5; Gates, 1; Granville, 5; Greene, 1; Iredell, 10; Lincoln, 1; McDowell, 2; Mecklenburg; New Hanover, 3; Rockingham, many; Rowan,

1; Rutherford, a few; Stanly; Union, 3; Wake, 1; Watauga, 12—21 counties.

DIPHTHERITIC SORE THROAT.—Wayne.

TYPHOID FEVER.—Alexander, many; Alleghany; Anson, 6; Ashe, 5; Burke, 4; Caldwell, 4; Caswell, 3; Catawba, 8; Chatham, a few; Clay, a few; Cleveland, a few; Craven, 3; Cumberland, 3; Currituck, a few; Franklin, 6; Gates, 2; Graham, 10; Granville, 2; Greene, 15; wood, 6; Hertford, 2; Iredell, 6; Jackson, 1; Jones, 1; Lincoln, 4; McDowell, several; Martin, 2; Mecklenburg; Nash, 2; New Hanover, 3; Northampton; Onslow, 3; Polk, 2; Richmond, 8; Robeson, a great many; Rockingham, many; Rowan, 4; Scotland, 4; Stanly, in all parts; Stokes, 3; Surry, 1; Swain, 1; Union, several; Vance, a few; Wake, 3; Wilkes, 6; Yadkin, 1—49 counties.

MALARIAL FEVER.—Bertie, in all parts; Brunswick; Caswell; Chatham, a few; Chowan, in all parts; Currituck; Dare, in all parts; Franklin; Gates, in all parts; Halifax, a few; Hertford; Hyde, in all parts; Jones, Martin; Onslow; Orange; Pasquotank, a few; Person; Richmond; Robeson; Wake; Warren, in many parts; Washington, in all parts—23 counties.

MALARIAL FEVER, PERNICIOUS.—Chowan, 2; Hyde, 3; Martin, 1; Wake, 1—4 counties.

MALARIAL FEVER, HEMORRHAGIC.—Bertie, 3; Brunswick, 1; Dare, 1; Gates, 1; Hertford, 3; Hyde, 1; Jones, 1; Martin, 2; Onslow, 1; Washington, 3—10 counties.

INFLUENZA.—Anson, a few cases in all parts; Brunswick; Greene, in all parts; Lenoir, in all parts; Sampson, Stokes, Warren, in many parts.

MUMPS.—Caldwell.

PNEUMONIA.—Alleghany; Gates, 2; Harnett; Lenoir, in all parts; Mitchell; Sampson, in many parts; Wake, 1; Yadkin, a few—8 counties.

TONSILLITIS.—Columbus.

SMALL-POX.—Buncombe, 14; Cabarrus, 46; Duplin, 8; Durham, 3; Gaston, several; Henderson, 6; Iredell, many; Mecklenburg, 20; Nash, 12; Rockingham, 5; Sampson, 1; Wayne, 25—12 counties.

ANTHRAX, IN CATTLE.—Lenoir.

CHOLERA, IN CHICKENS.—Graham and Haywood.

CHOLERA, IN HOGS.—Anson, Bertie, Brunswick, Chatham, Lenoir, Northampton, Richmond, Robeson, Rutherford, Sampson, Scotland, Wake and Yancey—13 counties.

DISTEMPER, IN HORSES.—Union and Yancey.

MENINGITIS, IN HORSES.—Hyde and Lenoir.

STAGGERS, IN HORSES.—Durham.

An undiagnosed epidemic in horses is reported from Person.

No diseases reported from Alamance, Beaufort, Bladen, Carteret, Davidson, Davie, Forsyth, Johnston, Pender, Pitt, Transylvania and Wilson.

No reports received from Cherokee, Montgomery, Moore, Perquimans and Randolph.

In view of the unfortunate condition of affairs in Wilson county—the extensive prevalence of small-pox, due, as we understand it, to the neglect of proper precautions by the County Superintendent, who persists in calling the disease “chicken-pox,” in the face of a contrary opinion by the State Small-pox Inspector, of leading physicians in the county, and of the County Superintendents of the adjoining counties of Edgecombe and Nash—we think it advisable to print again some-

thing on the differential diagnosis. We therefore extract from an article by Dr. Schamberg in a late number of *American Medicine* the following:

"In the eruptive stage small-pox may be confounded with chicken-pox, syphilis, impetigo contagiosa, pustular acne and drug eruptions.

Small-pox may be distinguished from chicken-pox by attention to the following data:

1. *Prodromal Symptoms*.—Fever, headache, backache, chills, vertigo, nausea, etc., occur two or three days before the outbreak of the variolous eruption. In exceptionally mild cases, however, these may be slight or even absent. In chicken-pox the fever and the eruption appear practically synchronously.

2. *Constitutional Symptoms*.—More severe in small-pox.

3. *Distribution of Eruption*.—In small-pox the eruption involves with predilection face, arms, hands, and legs; upon the trunk the lesions are more sparse. In chicken-pox the eruption is most profuse, as a rule, upon the trunk, chiefly the back. Small-pox prefers the exposed surfaces, chicken-pox the covered.

4. *Character of the Lesions*.—In small-pox they begin as firm, "shotty" papules, which slowly increase in size and develop into vesicles and pustules. Vesicles are uniform in size and often show umbilication. They are multilocular and difficult to rupture with the finger-nail. Chicken-pox lesions begin as "dewdrop-like" vesicles which have a velvety feel. They are unilocular, thin-roofed, can be easily ruptured with the finger-nail, and vary greatly in size.

6. *Course of Eruption*.—Small-pox eruption comes out in successive crops, and the lesions may be seen in varying stages of development. Small-pox eruption comes out in a single crop and the lesions usually remain uniform in character.

6. *Course of Eruption*.—Small-pox lesions under a gradual evolution from papules to crusts in the course of eight to

tendays. Chicken-pox lesions last several days and then crust. In the mild small-pox epidemic of a few years ago the lesions matured more rapidly than in the old-time small-pox, but the course of the eruption was nevertheless much longer than in varicella. The severity of the eruption is no absolute guide in the differential diagnosis. Severe cases of varicella may look far more formidable than mild cases of variola. I have seen undoubted small-pox in unvaccinated individuals with but two or three lesions present, and the general symptoms correspondingly mild."

Summary of Mortuary Reports for November, 1901.

(TWENTY-ONE TOWNS).

	White.	Col'd.	Total.
Aggregate population.....	71,090	47,200	118,290
Aggregate deaths...	88	102	190
Representing temporary annual death rate per 1,000.....	14.8	25.9	19.3
<i>Causes of Death.</i>			
Typhoid fever.....	3	0	3
Scarlet fever.....	3	0	3
Malarial fever.....	3	6	9
Diphtheria.....	2	1	3
Pneumonia.....	7	8	15
Consumption.....	11	19	30
Brain diseases.....	4	4	8
Heart diseases.....	7	8	15
Neurotic diseases...	2	2	4
Diarrhœal diseases	5	7	12
All other diseases..	39	43	82
Accident.....	1	3	4
Suicide.....	1	0	1
Violence.....	0	1	1
	88	102	190
Deaths under five years.....	25	32	57
Still-born.....	6	13	19

Mortuary Report for November, 1901.

TOWNS AND REPORTERS.	RACES.	POPULATION.		TEMPORARY ANNUAL DEATH RATE PER 1,000.																TOTAL DEATHS.		Deaths under five years.			
		By Races.	Total.	By Races.	Total.	Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrheal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.		By Races.	By Towns.	
Charlotte	W.	11,000		14.2		1						1	2					6		1		13	5	3	
Dr. F. O. Hawley.	C.	7,200	18,200	25.0	18.4			1				4		1	1			8				15	28	7	1
Durham	W.	10,000		9.6			3					1	1	1				2				2	13	4	0
Dr. N. M. Johnson.	C.	5,000	*15,000	12.0	10.4							1	1	1				1				5	3	1	
Fayetteville	W.	2,500		14.4																		3	9		1
Dr. John D. MacRae.	C.	2,300	4,800	31.3	22.5							1	3	1				1				6			1
Goldsboro	W.	3,400		17.6				1				1		1				2				5	12	1	1
Geo. E. Hood, Mayor.	C.	2,600	6,000	32.3	24.0			2				1		2		1		1				7	3	1	
Henderson	W.	2,300		10.4											1		1					2	5		
Dr. F. R. Harris.	C.	1,500	3,800	24.0	15.8									1				2				3			
Laurinburg	W.	900		0.0																		0	0		
Dr. A. W. Hamer.	C.	600	1,500	0.0	0.0																	0			
Lenoir	W.	1,200		10.0											1							0	1		
Dr. A. A. Kent.	C.	300	1,500	0.0	8.0																	0			
Marion	W.	800		15.0														1				1	1		
Dr. B. A. Cheek.	C.	350	1,150	0.0	10.4																	0			
Oxford	W.	1,200		10.0														1				1	2		
Dr. S. D. Booth.	C.	900	2,100	13.3	11.4			1														1			
Raleigh	W.	8,000		16.5					1			1	2	2			1	3	1			11	24	4	
T. P. Sale, Clerk B. H.	C.	5,800	13,800	26.9	20.9							1	1		1			8	2			13	3	3	
Reidsville	W.	2,900		12.4				1										2				3	6		
Jas. T. Smith, Cy. Cl.	C.	1,300	4,200	27.7	17.1								1	1				1				0			
Rockingham	W.	1,500		0.0																		0	0		
Dr. Wm. P. S. Webb.	C.	500	2,000	0.0	0.0																	0			
Rocky Mount	W.	1,500		24.0									2					1				3	3		
Dr. G. L. Wimberley, Jr.	C.	1,600	3,100	0.0	11.6																	0			
Salem	W.	3,300		10.9														3				3	4		1
J. A. Vance, Mayor.	C.	350	3,650	34.3	13.1							1										1			
Salisbury	W.	3,900		15.4		1								1								5	10		
Dr. W. W. McKenzie.	C.	2,500	6,400	24.0	18.7								1				1	2				1	5		
Smithfield	W.	620		0.0																		0	0		
J. C. Bingham, Mayor.	C.	450	1,070	0.0	0.0																	0			
Southport	W.	900		0.0																		0			
Dr. D. I. Watson.	C.	500	1,400	48.0	17.1							1						1				2	2	1	
Tarboro	W.	2,000		6.0										1								1	1		
Dr. L. L. Staton.	C.	500	2,500	0.0	4.8																	0			
Weldon	W.	700		0.0																		0	0		
J. T. Gooch, Mayor.	C.	750	1,450	0.0	0.0																	0			
Wilmington	W.	10,600		23.8		1	2					3	2	1	1	3	8					21	58	8	1
Dr. Chas. T. Harper.	C.	10,500	21,100	42.3	28.2		3					1	9	2	1	4	16	1				37	15	6	
Wilson	W.	1,870		44.9									2	1			1	3				7	11	3	
Dr. W. S. Anderson.	C.	1,700	3,570	28.2	36.7							1		1				2				4			

N. B.—The reporters for the cities and towns printed in **Black Type** have signed this certificate: "I hereby certify that this report gives the *whole* number of deaths occurring within the corporate limits during the above month." The total populations are taken from the census report for 1900, but the division into races is estimated, as those figures have not been given out.

*This is the estimate of the reporter since the extension of the city limits.

County Superintendents of Health.

Alamance	Dr. H. R. Moore.	Jones.....	Dr. S. E. Koonce.
Alexander	Dr. C. J. Carson.	Lenoir	Dr. C. L. Pridgen.
Alleghany	Dr. B. C. Waddell.	Lincoln	Dr. T. F. Costner.
Anson	Dr. J. H. Bennett.	McDowell	Dr. B. A. Cheek.
Ashe.....	Dr. J. W. Colvard.	Macon	Dr. F. L. Siler.
Beaufort	Dr. Jno. G. Blount.	Madison	Dr. Jas. K. Hardwicke.
Bertie	Dr. H. V. Dunstan.	Martin.....	Dr. W. H. Harrell.
Bladen.....	Dr. Newton Robinson.	Mecklenburg.....	Dr. C. S. McLaughlin.
Brunswick	Dr. J. A. McNeill.	Mitchell.....	Dr. V. R. Butt.
Buncombe	Dr. E. B. Glenn.	Montgomery	Dr. M. P. Blair.
Burke.....	Dr. J. L. Laxton.	Moore.....	Dr. Gilbert McLeod.
Cabarrus.....	Dr. R. S. Young.	Nash	Dr. J. P. Battle.
Caldwell	Dr. A. A. Kent.	New Hanover	Dr. W. D. McMillan.
Camden.....		Northampton.....	Dr. H. W. Lewis.
Carteret	Dr. F. M. Clark.	Onslow.....	Dr. E. L. Cox.
Caswell	Dr. S. A. Malloy.	Orange.....	Dr. D. C. Parris.
Catawba	Dr. Geo. H. West.	Pamlico.....	
Chatham.....	Dr. H. T. Chapin.	Pasquotank	Dr. J. E. Wood.
Cherokee.....	Dr. J. W. Patton.	Pender.....	Dr. R. J. Williams.
Chowan.....	Dr. T. J. Hoskins.	Perquimans	Dr. C. C. Winslow.
Clay.....	Dr. J. O. Nichols.	Person.....	Dr. J. A. Wise.
Cleveland	Dr. B. H. Palmer.	Pitt.....	Dr. C. O'H. Laughing-
Columbus.....	Dr. I. Jackson.	house.	
Craven.....	Dr. N. H. Street.	Polk	Dr. Earle Grady.
Cumberland.....	Dr. Jno. D. McRae.	Randolph	Dr. S. A. Henley.
Currituck.....	Dr. H. M. Shaw.	Richmond.....	Dr. Wm. P. Webb.
Dare	Dr. W. B. Fearing.	Robeson	Dr. H. T. Pope.
Davidson	Dr. Joel Hill.	Rockingham	Dr. Sam Ellington.
Davie	Dr. James McGuire.	Rowan.....	Dr. W. L. Crump.
Duplin.....	Dr. O. F. Smith.	Rutherford.....	Dr. T. B. Twitty.
Durham	Dr. N. M. Johnson.	Sampson	Dr. R. E. Lee.
Edgecombe	Dr. L. L. Staton.	Scotland	Dr. A. W. Hamer.
Forsyth.....	Dr. John Bynum.	Stanly.....	Dr. V. A. Whitley.
Franklin	Dr. E. S. Foster.	Stokes	Dr. W. V. McCanless.
Gaston.....	Dr. J. H. Jenkins.	Surry	Dr. John R. Woltz.
Gates.....	Dr. W. O. P. Lee.	Swain.....	Dr. J. A. Cooper.
Graham	Dr. R. J. Orr.	Transylvania	Dr. C. W. Hunt.
Granville	Dr. S. D. Booth.	Tyrrell.....	
Greene.....	Dr. Joseph E. Grimsley.	Union	Dr. J. E. Ashcraft.
Guilford.....	Dr. Edmund Harrison.	Vance.....	Dr. Goode Cheatham.
Halifax	Dr. I. E. Green.	Wake.....	Dr. J. J. L. McCullers.
Harnett.....	Dr. O. L. Denning.	Warren.....	Dr. A. S. Pendleton.
Haywood	Dr. S. B. Medford.	Washington	Dr. W. H. Ward.
Henderson	Dr. J. G. Waldrop.	Watauga.....	Dr. T. C. Blackburn.
Hertford	Dr. J. H. Mitchell.	Wayne.....	Dr. Williams Spicer.
Hyde.....	Dr. E. H. Jones.	Wilkes.....	Dr. W. P. Horton.
Iredell	Dr. Henry F. Long.	Wilson.....	Dr. W. S. Anderson.
Jackson.....	Dr. Wm. Self.	Yadkin	Dr. S. L. Russell.
Johnston	Dr. L. D. Wharton.	Yancey	Dr. J. L. Ray.

[You are asked to fill out and mail one of these forms to the Superintendent of Health of your county on or before the third of each month, that he may use it in making his report to the Secretary of the State Board.]

Have any of the following diseases occurred in your practice during the month just closed. If so, state number of cases.

Whooping-cough ----- Typhoid Fever -----

Measles ----- Typhus Fever -----

Diphtheria ----- Yellow Fever -----

Scarlet Fever ----- Cholera -----

Pernicious Malarial Fever ----- Smallpox -----

Hemorrhagic Malarial Fever ----- Cerebro-spinal Meningitis -----

What have been the prevailing diseases in your practice?

Has any epidemic occurred among domestic animals? If so, what?

What is the sanitary condition of your section, public and private?

General Remarks: -----

----- M. D.

----- 190 ----- N. C.

BULLETIN

OF THE

North Carolina Board of Health.

Published Monthly at the Office of the Secretary of the Board, Raleigh, N. C.

GEO. G. THOMAS, M. D., *Pres.*, Wilmington.

S. WESTRAY BATTLE, M. D.....Asheville.

HENRY W. LEWIS, M. D.....Jackson.

J. L. NICHOLSON, M. D.....Richlands

RICHARD H. LEWIS, M. D., *Secretary and Treasurer*, Raleigh.

W. P. IVEY, M. D.....Lenoir.

FRANCIS DUFFY, M. D.....New Bern.

W. H. WHITEHEAD, M. D.....Rocky Mt.

J. L. LUDLOW, C. E.....Winston.

VOL. XVI.

JANUARY, 1902.

No. 10.

The Management of Small-pox.

Small-pox is the most loathsome and one of the most contagious of all diseases. It is at the same time the most easily and certainly preventable. For the past three years it has been widely prevalent in the United States, and since January, 1898, has existed in North Carolina, the total number of cases admitted to be small-pox being up to May 1, 1901, 5,367, with 118 deaths, representing a total death rate of 2.2 per cent., among the whites 3.3 per cent., among the colored 1.5 per cent. The disease has generally been mild in degree and often atypical in character, rendering the diagnosis sometimes difficult to the inexperienced. The recognition of these peculiarities of this epidemic and the wide publication of the same have practically removed all excuse for mistake in diagnosis. It is safe to say that any eruptive disease closely resembling small-pox occurring in an adult and preceded by headache, backache, nausea and fever, no matter how slight,

for two or three days before the eruption and passing off with its appearance, is small-pox. In some cases the symptoms mentioned are so slight as to be overlooked.

Our experience in the past three years has demonstrated that communities in which the disease was promptly recognized and acknowledged and handled, so to speak, with gloves off, have managed outbreaks of small-pox at a minimum of suffering, inconvenience, loss of business and actual expense. Those communities which have dallied with the situation, calling it chicken-pox, and omitting all precautions until the infection became widely disseminated, have suffered most. Every extensive outbreak in this State has been preceded by this state of affairs. The greatest stumbling-block in the way of successful management has unquestionably been the "chicken-pox doctor," re-inforced too frequently by factional divisions in the medical profession.

PREVENTION.

In common with all infectious diseases the spread of small-pox can be prevented by quarantine and disinfection. It alone can also be prevented by vaccination.

1. *Vaccination*.—By all odds vaccination is the most certain, the simplest and the cheapest method of prevention. In fact it is practically the only way to prevent small-pox. To be effective in its bearing on the community it must be universal, and compulsion should be employed if necessary to secure this. Those who have not been successfully vaccinated within three years at most should be re-vaccinated. Vaccination should always be performed by a physician, who should first scrub the arm thoroughly with soap and water and conclude the cleansing process with alcohol. The best virus should be used and the glycerinized lymph, preferably in the form of points, is recommended. If a steel scarifier is used it should be disinfected after every vaccination by passing it through a flame. The sleeve should not be rolled down until the seat of operation is dry. Attention to these little details, which altogether would require only a minute or two, would save many a "bad arm." All persons who have been exposed should be vaccinated immediately in three places at the same time, about an inch apart, to increase the chances of its "taking."

2. *Quarantine*.—Quarantine, to be effective, must be rigidly thorough. The best method, particularly in the beginning, when the cases are few, is by the employment of a special hospital or pest-house, to which all cases should be immediately removed; and a house of detention, in which all suspects should be confined for fifteen days from time of exposure. Cheap wooden buildings or floored tents heated with wood stoves would answer in this climate.

When small-pox is quarantined at home the patient should be isolated in a room, seeing only his physician and nurse. Members of the household should be restricted to the premises. This is usually accomplished by guards, but since the amendment of the law making the violation of rules and regulations adopted by the county sanitary committee a misdemeanor the following method would probably be equally as effective and much cheaper, especially in outbreaks of any considerable extent. Let the sanitary committee pass an order forbidding the members of a household infected with small-pox to leave the premises except upon the written permission of the Superintendent of Health or his regularly appointed assistant. Then have a deputy sheriff patrol the neighborhood and arrest all such violators and punish them by fine or imprisonment. One or two examples would secure obedience to the order.

3. *Disinfection*.—Thorough disinfection of infected houses and their contents is all-important. Everything of small value should be burned; other things that can be should be boiled and the remaining contents, including woolen wearing apparel, well spread out, should be purified by the use of a sufficient quantity of some gaseous disinfectant when feasible. Sulphur, four (4) pounds to the room, would answer, but formaldehyde is preferable, being probably more certain and possessing the great advantage of not injuring the most delicate colors. Another advantage, especially in the case of the poor, is that the house can be completely disinfected in six or eight hours, the fumes quickly neutralized by a little ammonia water, and the inmates permitted to return for the night.

There are a number of good formaldehyde generators on the market, the

Kuhn, the Mulford, the Park-Davis, the Kny-Scheerer, the West, and others, but one made by Charles R. Lentz & Sons, of Philadelphia, is about as good as any and quite inexpensive, costing only twelve or fifteen dollars. Every county and town of any size should have a formaldehyde generator for use not only in small-pox but in other contagious diseases, as scarlet fever and diphtheria.

Where the house is too open to permit the complete closure of all cracks by pasting strips of paper over them it should be washed and sprayed with a solution of bichloride of mercury 1 to 1,000. An ordinary foot fruit sprayer, costing \$3, will do the work.

THE RESPONSIBILITY.

Except in cities and towns having organized health departments with their own medical health officer the responsibility for carrying out the above rests upon the county sanitary committee, which is composed of the Board of County Commissioners and two physicians. This is definitely set forth in section 5 of chapter 214, Laws of 1893, as amended by the General Assembly of 1901, which says "the county sanitary committee shall have the care and responsibility of the health interests of their county," at the same time conferring upon them the authority and power necessary to meet this responsibility.

As we propose to reprint the above, essentially, for distribution in the future as occasion may demand, we would appreciate very much any suggestions looking to its improvement. We hope our readers, especially health officers, who have had practical experience with the conditions as they actually exist, will respond to this request.

Small-pox in Wilson County.

We are very glad to announce that the County Sanitary Committee of Wilson has in all essential particulars complied with the recommendations or suggestions made at the Rocky Mount meeting of health officials of the adjoining counties and of the State on the 14th inst. to consider the small-pox problem in that county. In referring to the disease about which there had been so much dispute the committee appointed by the meeting to prepare the recommendations to be presented to Wilson, in order to avoid all contingencies, used the expression "small-pox, chicken-pox or any other eruptive disease." The sanitary committee objected to "any eruptive disease" as a reflection on them, we substituting "small-pox or this eruption now prevailing," adopted the suggestions for all practical purposes. The action taken is set forth in the following from the transactions sent us by Dr. W. J. Jones, Jr., secretary of the committee:

"At a meeting of the Sanitary Board of Wilson county, held January 17, 1902, the following resolutions were adopted and the Superintendent of Health ordered to have the same put in force and effect:

"1. All persons residing in the infected towns or districts of Wilson county, who have not been previously successfully vaccinated, or who have not had small-pox or this eruptive disease called small-pox, shall be vaccinated within ten days after the publication of this notice. Any person residing in such district, failing to be vaccinated within the date designated shall be immediately vaccinated by the public vaccinator, and upon refusal to submit to such vaccination, said person shall be arrested and tried and punished for a misdemeanor.

Immediately upon the appearance of small-pox in any portion of the county not now infected the above rules shall apply.

"2. All persons affected with small-pox or with this prevailing eruption shall be either conveyed to the county small-pox hospital or strictly quarantined at home, and the members of each and every household in which said disease is quarantined are requested to remain on their premises unless they have written permission from the County Superintendent of Health or his authorized substitute to leave the same. Any person violating this rule will be promptly arrested and punished. No infected person, or one who has been exposed, shall be given permission to leave the premises until his person has been disinfected and he has put on clean clothes and the house has been fumigated.

"3. All premises in which there has occurred and may occur cases of small-pox or this eruption now prevailing, including the wearing apparel of the inmates, shall be thoroughly fumigated and disinfected. That an officer shall be appointed to do this under the authority and supervision of the County Superintendent of Health.

"N. B.—The authority for the adoption of the above rules and regulations and for the enforcement of the same by a fine not exceeding fifty dollars or imprisonment not exceeding thirty days is conferred upon the County Sanitary Committee by section 5 of chapter 214 of the Laws of 1893, and notice is hereby given that any violations will be promptly and rigidly punished.

"W. J. JONES, JR.,

"DR. R. H. LEWIS, "Secretary.

"Raleigh, N. C."

The Old Oaken Bucket—A Hygienic View.

The truths of science are not often expressed in verse, and this fact serves to emphasize the few instances where rime has been employed to convey fact. The following parody on "The Old Oaken Bucket," which is not only amusing, but contains some valuable points in sanitation, is by Dr. J. C. Bayles, formerly President of the New York City Health Board, and was read by him at a meeting of the Academy of Medicine. We quote it from the columns of *Engineering News*, which says that the sanitary science conveyed in the verses may seem elementary indeed to our readers, yet it needs but the slightest knowledge of conditions about the average farm-house and country village to realize that millions of people are living amid just such unhealthful surroundings in entire ignorance that they have anything to do with causing disease and death. The parody is as follows:

With what anguish of mind I remember
my childhood,

Recalled in the light of a knowledge
since gained.

The malarious farm, the wet fungus-
grown wildwood,

The chills then contracted that since
have remained;

The scum-covered duck-pond, the pig-sty
close by it.

The ditch where the sour-smelling
house drainage fell.

The damp, shaded dwelling, the foul
barn-yard nigh it—

But worse than all else was that ter-
rible well.

And the old oaken bucket, the mold-
crusted bucket,

The moss-covered bucket that hung in
the well.

Just think of it! Moss on the vessel
that lifted

The water I drank in the days called
to mind;

Ere I knew what professors and scientists
gifted

In the waters of wells by analysis find;
The rotting wood fibre, the oxid of iron,
The algae, the frog of unusual size,
The water, impure as the verses of Byron,
Are things I remember with tears in
my eyes.

And to tell the sad truth—tho' I shudder
to think of it—

I considered that water uncommonly
dear.

And often at noon, when I went there
to drink of it,

I enjoyed it as much as I now enjoy
beer.

How ardent I seized it with hands that
were grimy,

And quick to the mud-covered bottom
it fell,

Then reaching with nitrates and nitrites,
and slimy

With matter organic it rose from the
well.

Oh, had I but realized in time to avoid
them—

The dangers that lurked in that pes-
tilent draft—

I'd have tested for organic germs and
destroyed them—

With potassic permanganate ere I had
quaffed.

Or perchance I'd have boiled it, and
afterward strained it

Through filters of charcoal and gravel
combined;

Or, after distilling, condensed, and re-
gained it

In potable form, with its filth left be-
hind.

How little I knew of the enteric fever

Which lurked in the water I ventured
to drink,

But since I've become a devoted believer

In the teachings of science, I shudder
to think.

And now, far removed from the scenes
I'm describing.

The story of warning to others I tell,
As memory reverts to my youthful im-
bibing

And I gag at the thought of that hor-
rible well.

And the old oaken bucket, the fungus-
grown bucket—

In fact, the slop bucket—that hung in
the well.

—*Literary Digest.*

Review of Diseases for December, 1901.

EIGHTY-SEVEN COUNTIES REPORTING.

Ninety-four counties have Superinten-
dents of Health.

Except in the case of the more conta-
gious and dangerous diseases the Super-
intendent has, as a rule, to rely upon his
own information alone, since few phy-
sicians can be induced to report cases of
non-contagious diseases to him.

Where the number of cases is not given
or the prevalence of a disease otherwise
indicated, its mere presence in the county
is to be understood as reported.

For the month of December the follow-
ing diseases have been reported from the
counties named:

MEASLES.—Brunswick, many cases;
Cleveland, a few; Columbus, many; Har-
nett, a few; Randolph, several; Rocking-
ham; Scotland, 10; Watauga, several—
8 counties.

WHOOPING-COUGH.—Alamance, 3; Gran-
ville, 3; Harnett, a few; Hertford, 2;
Hyde, in all parts; Orange, a few; Pas-
quotank, 10; Perquimans, 2; Person;
Randolph, in all parts; Rockingham;
Rutherford, a few; Union, 1; Wayne, a
few—14 counties.

SCARLET FEVER.—Ashe, 15; Buncombe,
3; Cabarrus, 5; Caswell, several; Cat-
tawba, 1; Craven, 1; Durham, 1; For-
syth, 1; Gaston, a few; Guilford, 4;
Harnett, a few; Haywood, a few; Hen-
derson, 3; McDowell, 3; Macon, several;
Madison, 15; New Hanover, 2; Person,
4; Randolph, a few; Rockingham;
Rowan, 1; Stanly; Swain, 6; Union, 1;

Watauga, several; Wilson, 1; Yancey, a few—27 counties.

DIPHTHERIA.—Brunswick, many; Carteret, 4; Craven, 3; Cumberland, 1; Gaston, a few; Guilford, 9; Haywood, 2; Mecklenburg, several; Randolph, 4; Rockingham; Scotland, 2; Stanly; Surry, 2; Wilson, 1—14 counties.

TYPHOID FEVER.—Alleghany, several; Anson, a few; Caswell, 5; Catawba, 2; Clay, a few; Columbus, several; Craven, 2; Franklin, 6; Gates, 1; Graham, 3; Granville, 1; Greene, 2; Harnett, many; Haywood, 9; Iredell, 2; Jones, 3; Mecklenburg, several; Nash, 3; New Hanover, 6; Perquimans, 1; Polk, 1; Randolph, 6; Robeson, a few; Rockingham; Rowan, 4; Stanly; Stokes, 1; Surry, 2; Union, several; Wake, 7; Yadkin, 2—31 counties.

MALARIAL FEVER.—Alamance, Bertie, Halifax, Hertford, Jones, Martin, Pasquotank, Pender, Perquimans, Robeson, Wake—11 counties.

MALARIAL FEVER, PERNICIOUS.—Martin, 1; Robeson, a few; Wake, 1—3 counties.

MALARIAL FEVER, HEMORRHAGIC.—Hertford, 3; Jones, 1; Pasquotank, 2; Perquimans, 5—4 counties.

INFLUENZA.—Caswell; Columbus; Currituck; Duplin; Lenoir, in all parts; Macon; Mitchell; Person; Sampson, in all parts; Stokes; Swain; Washington—12 counties.

MUMPS.—Caldwell; Martin; Rockingham, in all parts—3 counties.

PNEUMONIA.—Alexander, a few; Burke, a few; Caswell; Currituck, many; Gaston; Granville; Halifax; Mitchell; Polk, 1; Sampson, in all parts; Wake—11 counties.

VARICELLA.—Anson; McDowell, several; Mitchell; Sampson, in all parts—4 counties.

SMALL-POX.—Buncombe, 14; Cabarrus, 38; Duplin, 2; Durham, 2; Edgecombe, 5; Forsyth, 30; Gaston, a few; Greene, 7; Henderson, 3; Iredell; Mecklenburg, 35; Nash, 8; Polk, 2; Rockingham, 3; Rowan, 2; Rutherford, 2; Sampson, 5; Swain, 3; Union, 2; Wayne, a great many; *Wilson, 19—21 counties.

CHOLERA, IN CHICKENS.—Hertford and Rutherford—2 counties.

CHOLERA, IN HOGS.—Chowan, Columbus, Onslow, Pender, Randolph, Robeson, Scotland and Wayne—9 counties.

STAGGERS, OR MENINGITIS, IN HORSES.—Currituck, Hertford, Hyde, Lenoir, New Hanover and Pasquotank—6 counties.

No diseases of importance reported from Beaufort, Bladen, Chatham, Chowan, Dare, Davidson, Davie, Johnston, Lincoln, Onslow, Pitt and Wilkes.

No reports received from Cherokee, Jackson, Montgomery, Moore, Richmond, Transylvania and Vance.

Summary of Mortuary Reports for December, 1901.

(TWENTY-FOUR TOWNS).

	White.	Col'd.	Total.
Aggregate population.....	82,420	54,500	136,920
Aggregate deaths.....	83	103	183
Representing temporary annual death rate per 1,000.....	12.1	22.7	16.0
<i>Causes of Death.</i>			
Typhoid fever.....	3	1	4
Scarlet fever.....	2	0	2
Diphtheria.....	1	0	1
Whooping-cough..	0	1	1
Pneumonia.....	15	16	31
Consumption.....	13	12	25
Brain diseases.....	3	4	7
Heart diseases.....	7	12	19
Neurotic diseases..	0	3	3
Diarrhoeal diseases	4	1	5
All other diseases..	33	49	82
Accident.....	2	4	6
	83	103	186
Deaths under five years.....	15	23	38
Still-born.....	8	12	20

*Report of the Superintendent of Health, who has denied that the prevailing eruptive disease was small-pox. By other physicians outside of Wilson town sixty cases of small-pox are reported.

Mortuary Report for December, 1901.

TOWNS AND REPORTERS.	RACES.	POPULATION.		TEMPORARY ANNUAL DEATH RATE PER 1,000.																TOTAL DEATHS.			
		By Races.	Total.	By Races.	Total.	Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neuritic Diseases.	Diarrhoeal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	By Races.	By Towns.
Asheville	W.	10,000	14,800	9.6	13.8	1	1					1	1					3	1			8	17
Dr. C. V. Reynolds.	C.	4,800		22.5									1	1		3			4				9	1
Charlotte	W.	11,000	18,200	13.1	16.5							1	4	1	1			6				12	33
Dr. F. O. Hawley.	C.	7,200		21.7									6	1					6				13	6
Durham	W.	10,000	15,000	6.0	12.8							1	1			1		2				5	16
Dr. N. M. Johnson.	C.	5,000		24.4									1	4	1		1	1	3				11	1
Fayetteville	W.	2,500	1,800	9.6	15.0							1	1					2				2	6
Dr. John D. MacRae.	C.	2,300		22.3															2				4
Goldshoro	W.	3,400	6,000	17.6	16.0											2	1	2				5	8
Geo. E. Hood, Mayor.	C.	2,600		13.8									1						2				3	1
Henderson	W.	2,300	3,800	5.2	6.3													1				1	2
Dr. F. R. Harris.	C.	1,500		8.0															1				1
Laurinburg	W.	900	1,500	13.3	8.0													1				1	1
Dr. A. W. Hamer.	C.	600		0.0																			0
Lenoir	W.	1,200	1,500	10.0	8.0										1							1	1
Dr. A. A. Kent.	C.	300		0.0																			0
Mt. Olive	W.	700	1,000	34.3	24.0	1							1									2	2
Dr. C. S. Maxwell.	C.	300		0.0																			0
Marion	W.	800	1,150	0.0	0.0																	0	0
Dr. B. A. Cheek.	C.	350		0.0																			0
Monroe	W.	1,850	2,450	6.5	4.9									1								1	1
Dr. J. M. Blair.	C.	600		0.0																			0
Oxford	W.	200	2,100	0.0	22.8																	0	4
Dr. S. D. Booth.	C.	900		54.4										2	2								4	1
Raleigh	W.	8,000	13,800	18.0	24.3			1				1	2	1	1		7					12	28
T. P. Sale, Clerk B. H.	C.	5,800		33.1		1		1		2	1	2		2				8	1				16	4
Reidsville	W.	2,900	4,200	8.3	11.4							1					1					2	4
Jas. T. Smith, Cy. Cl.	C.	1,300		18.5									1					1					
Rocky Mount	W.	1,500	3,100	24.0	15.5												1	2				3	4
Dr. G. L. Wimberley, Jr.	C.	1,600		7.5														1					1
Salem	W.	3,300	3,650	0.0	3.3																	0	1
J. A. Vance, Mayor.	C.	350		34.3												1							1
Salisbury	W.	3,900	6,400	18.5	15.0							4						2				6	8
Dr. W. W. McKenzie.	C.	2,500		9.6															2				2
Smithfield	W.	620	1,070	0.0	0.0																	0	0
J. C. Bingham, Mayor.	C.	450		0.0																			0
Southport	W.	900	1,400	13.3	25.7													1				1	3
Dr. D. I. Watson.	C.	500		18.0															2				2
Tarboro	W.	2,000	2,500	0.0	0.0																	0	0
Dr. L. L. Staton.	C.	500		0.0																			0
Washington	W.	2,300	3,600	20.9	12.2								1	1	1			1				4	5
Dr. Jno. G. Blount.	C.	1,300		4.6										1									1
Weldon	W.	700	1,450	17.1	16.5								1									1	2
J. T. Gooch, Mayor.	C.	750		16.0										1									1
Wilmington	W.	10,600	21,100	14.7	22.7	1						2	2	1	1	1	4	1				13	40
Dr. Chas. T. Harper.	C.	10,500		30.8									2	1	1	4	2	14	3				27	12
Wilson	W.	1,850	3,550	19.5	27.0	1						2										3	8
Dr. W. S. Anderson.	C.	1,700		35.2									2						3				5

N. B.—The reporters for the cities and towns printed in **Black Type** have signed this certificate: "I hereby certify that this report gives the *whole* number of deaths occurring within the corporate limits during the above month." The total populations are taken from the census report for 1900, but the division into races is estimated, as those figures have not been given out.

*This is the estimate of the reporter since the extension of the city limits.

County Superintendents of Health.

Alamance	Dr. H. R. Moore.	Jones.....	Dr. S. E. Koonce.
Alexander	Dr. C. J. Carson.	Lenoir	Dr. C. L. Pridgen.
Alleghany	Dr. B. C. Waddell.	Lincoln	Dr. T. F. Costner.
Anson	Dr. J. H. Bennett.	McDowell	Dr. B. A. Cheek.
Ashe.....	Dr. J. W. Colvard.	Macon	Dr. F. L. Siler.
Beaufort	Dr. Jno. G. Blount.	Madison	Dr. Jas. K. Hardwicke.
Bertie	Dr. H. V. Dunstan.	Martin.....	Dr. W. H. Harrell.
Bladen.....	Dr. Newton Robinson.	Mecklenburg.....	Dr. C. S. McLaughlin.
Brunswick	Dr. J. A. McNeill.	Mitchell	Dr. V. R. Butt.
Buncombe	Dr. E. B. Glenn.	Montgomery	Dr. M. P. Blair.
Burke.....	Dr. J. L. Laxton.	Moore.....	Dr. Gilbert McLeod.
Cabarrus	Dr. R. S. Young.	Nash	Dr. J. P. Battle.
Caldwell	Dr. A. A. Kent.	New Hanover	Dr. W. D. McMillan.
Camden.....		Northampton.....	Dr. H. W. Lewis.
Carteret	Dr. F. M. Clark.	Onslow.....	Dr. E. L. Cox.
Caswell	Dr. S. A. Malloy.	Orange.....	Dr. D. C. Parris.
Catawba	Dr. Geo. H. West.	Pamlico.....	
Chatham.....	Dr. H. T. Chapin.	Pasquotank	Dr. J. E. Wood.
Cherokee.....	Dr. J. W. Patton.	Pender.....	Dr. R. J. Williams.
Chowan.....	Dr. T. J. Hoskins.	Perquimans	Dr. C. C. Winslow.
Clay	Dr. J. O. Nichols.	Person	Dr. J. A. Wise.
Cleveland	Dr. B. H. Palmer.	Pitt.....	Dr. C. O'H. Laughing-
Columbus.....	Dr. I. Jackson.		house.
Craven.....	Dr. N. H. Street.	Polk	Dr. Earle Grady.
Cumberland.....	Dr. Jno. D. McRae.	Randolph	Dr. S. A. Henley.
Currituck	Dr. H. M. Shaw.	Richmond.....	Dr. Wm. P. Webb.
Dare	Dr. W. B. Fearing.	Robeson	Dr. H. T. Pope.
Davidson.....	Dr. Joel Hill.	Rockingham	Dr. Sam Ellington.
Davie	Dr. James McGuire.	Rowan.....	Dr. W. L. Crump.
Duplin	Dr. O. F. Smith.	Rutherford.....	Dr. T. B. Twitty.
Durham	Dr. N. M. Johnson.	Sampson	Dr. R. E. Lee.
Edgecombe	Dr. L. L. Staton.	Scotland	Dr. A. W. Hamer.
Forsyth.....	Dr. John Bynum.	Stanly.....	Dr. V. A. Whitley.
Franklin	Dr. E. S. Foster.	Stokes	Dr. W. V. McCannless.
Gaston.....	Dr. J. H. Jenkins.	Surry	Dr. John R. Woltz.
Gates.....	Dr. W. O. P. Lee.	Swain.....	Dr. J. A. Cooper.
Graham	Dr. R. J. Orr.	Transylvania	Dr. C. W. Hunt.
Granville	Dr. S. D. Booth.	Tyrrell.....	
Greene.....	Dr. Joseph E. Grimsley.	Union	Dr. J. E. Ashcraft.
Guilford.....	Dr. Edmund Harrison.	Vance.....	Dr. Goode Cheatham.
Halifax	Dr. I. E. Green.	Wake.....	Dr. J. J. L. McCullers.
Harnett.....	Dr. O. L. Denning.	Warren.....	Dr. A. S. Pendleton.
Haywood	Dr. S. B. Medford.	Washington	Dr. W. H. Ward.
Henderson	Dr. J. G. Waldrop.	Watauga.....	Dr. T. C. Blackburn.
Hertford	Dr. J. H. Mitchell.	Wayne.....	Dr. Williams Spicer.
Hyde	Dr. E. H. Jones.	Wilkes.....	Dr. W. P. Horton.
Iredell	Dr. Henry F. Long.	Wilson.....	Dr. W. S. Anderson.
Jackson.....	Dr. Wm. Self.	Yadkin	Dr. S. L. Russell.
Johnston	Dr. L. D. Wharton.	Yancey	Dr. J. L. Ray.

[You are asked to fill out and mail one of these forms to the Superintendent of Health of your county on or before the third of each month, that he may use it in making his report to the Secretary of the State Board.]

Have any of the following diseases occurred in your practice during the month just closed. If so, state number of cases.

Whooping-cough ----- Typhoid Fever -----

Measles ----- Typhus Fever -----

Diphtheria ----- Yellow Fever -----

Scarlet Fever ----- Cholera -----

Pernicious Malarial Fever ----- Smallpox -----

Hemorrhagic Malarial Fever ----- Cerebro-spinal Meningitis -----

What have been the prevailing diseases in your practice?


Has any epidemic occurred among domestic animals? If so, what?

What is the sanitary condition of your section, public and private?

General Remarks: -----

----- M. D.

----- 190 ----- N. C.

 The attention of physicians is called to the article entitled Biological Examinations.

BULLETIN

OF THE

North Carolina Board of Health.

Published Monthly at the Office of the Secretary of the Board, Raleigh, N. C.

GEO. G. THOMAS, M. D., *Pres.*, Wilmington.
S. WESTRAY BATTLE, M. D., Asheville.
HENRY W. LEWIS, M. D., Jackson.
J. L. NICHOLSON, M. D., Richlands.

W. P. IVEY, M. D., Lenoir.
FRANCIS DUFFY, M. D., New Bern.
W. H. WHITEHEAD, M. D., Rocky Mt.
J. L. LUDLOW, C. E., Winston.

RICHARD H. LEWIS, M. D., *Secretary and Treasurer*, Raleigh.

VOL. XVI.

FEBRUARY, 1902.

No. 11.

Biological Examinations.

After extremely vexatious delays on the part of the manufacturers, we have at last succeeded in obtaining a supply of mailing cases for diphtheria specimens. A sufficient number of these cases will be sent to each superintendent of health and municipal health officer applying for them, so that they may be in immediate reach and prevent delay in obtaining a report on doubtful cases. We will also wire the report at our expense. In addition we will send a supply of outfits for blood examinations in typhoid and malarial fevers. As there is no urgency in the matter of the diagnosis of tuberculosis, and as our means are very limited, we will not place on deposit mailing cases for sputum, but will gladly send a case to any physician asking for it. Physicians, therefore, desiring the help of the Biologist in diphtheria, typhoid and malaria will apply to their local health officer for mailing case and

instructions; in tuberculosis directly to the Biologist, Mr. G. McCarthy, Department of Agriculture, Raleigh.

Our first intention was to deposit these outfits with all health officers, but our supply is limited, and it would be simply throwing them away to send them to those who are not sufficiently interested to ask for them. We will, however, place them on deposit if one physician in a county asks it.

We have been greatly disappointed at the lack of appreciation of this work which seems to exist. We would be ashamed to mention the number of applications that have been received since the beginning of this year. Unless our health officers and physicians avail themselves of this privilege offered them free of expense it will surely be withdrawn by the Department of Agriculture. We have now done or offered to do everything except take the specimen in person.

A Century of Vaccination.

BY FLOYD M. CRANDALL, M. D.,
New York City.

[That vaccination will prevent smallpox belongs in the same class of beliefs of the well-informed, unprejudiced, civilized man as that the sun will rise to-morrow morning. We therefore print the following most interesting and valuable article, not for the purpose of proving the proposition, but chiefly to refresh the minds of our medical readers with some of the facts that they may meet more easily and satisfactorily the objections of the ignorant and prejudiced. As smallpox is likely to remain with us for some time to come, it might be just as well for them to preserve this number.—Ed.]

INTRODUCTION.

It is scarcely an exaggeration to say that outside of the multiplication table no proposition can be made which may not elicit discussion or actual disbelief. That disbelief in the efficacy of vaccination can exist at the present day is attributable partly to this tendency of the human mind to question and to doubt, and partly to ignorance. The very success of vaccination has engendered a feeling of security, for the present generation is ignorant of the gravity of smallpox.

The antivaccinationists furnish some very interesting studies in psychology. Some are honest, while some unfortunately are but "indifferent honest." A considerable number are simply cranks and belong to the great army of the

antis. This country seems to afford extraordinary facilities for the development of that particular form of mental pervert which perpetually takes the opposite side and objects to the established order of things. They are like the Irishman shipwrecked upon an unknown coast, who was certain of but one thing—he was "agin the governmint." Who can doubt the greatness of a country which can produce a Mrs. Eddy and a Mrs. Nation, a Dowie and a Debs; that can sustain so generously the osteopaths, the vitopaths, the electropaths, the hydropaths, the eclectics, the faith-healers, the christian scientists, the theosophists, the spiritualists, the vegetarians, the antivivisectionists, the antivaccinationists, and all the other *antis* whose names are legion?

It is useless to attempt to convince the antivaccinationist possessing that unbalanced type of mind which leads to the acceptance of these various distorted theories. The mind of the bigot, like the eye, contracts as more light is poured upon it. Discussion but fixes such an individual in his beliefs. There are, however, people in every community who, through lack of knowledge, believe themselves to be opposed to vaccination. They are a class apart from the professional agitators, to whom reference has just been made.

Almost without exception the articles which appear from time to time against vaccination, are written by members of the first-mentioned class. They are mostly written in a petulant and irritated tone, and are utterly lacking in logic. They are extreme in statement, and, as a rule, are positively untruthful. The following brief quotations are fair

examples of the style of these articles and the class of argument which they present. They are from an article, "The Bugaboo of Smallpox," by the Secretary of the Antivaccination Society of America, appearing in the *Homeopathic Physician*: "There is abundant evidence to prove that of all filth diseases smallpox was the lightest till the doctors made it a great cause of death, first by inoculation, then by vaccination." "Smallpox properly treated is neither dangerous nor infectious: none but infants or persons of enfeebled vitality should die of it." "No one need hesitate to nurse those sick with it, if attended by a physician who knows how to cure it, which unfortunately few of them do." "Scare is the chief element of danger, and is wholly groundless."

The following pleasing quotations are from a paper by the same author read in 1897 before the Medico-Legal Society of New York: "There never has been the smallest evidence deserving the attention of a rational being, that vaccination does prevent, or ever has prevented an attack of smallpox except by killing the patient before smallpox reached him." "It is really marvelous in the face of facts, how official doctors, aided by pseudohistorians, such as Macaulay, have succeeded in scaring the world about smallpox. Until the doctors got in their fads, smallpox was but one of the diseases which expressed the filth and gluttony of our ancestors, and was really one of the mildest of the lot."

In view of the fact that arguments of this character are those commonly promulgated by the antivaccination societies, the following from an editorial article in the *New York Times* cannot be

regarded as an exaggeration: "Every attentive observer of current events must have heaved a sigh of discouragement when he read that men and women, nominally sane, had met in this city and revived the old Anti-Vaccination Society. It is really a cause for humiliation, and perhaps shame, that such a thing should take place here, and at this time, in the center of our boasted civilization, and after the experience of a hundred years has left, in minds open to conviction, no more doubt of vaccination's incalculable value than there is of the good results that have followed the use of antiseptic measures in surgery. The formation of this society is not less disgraceful to the city, than would be the trial of an old woman for witchcraft in the court of Oyer and Terminer."

So little smallpox is seen at the present day that people have become apathetic regarding it and in many communities vaccination is much less thoroughly carried out than it was a hundred years ago. With a full knowledge of the seriousness of the disease and with the clear evidence of the marvelous efficacy of vaccination, the operation was then extensively and thoroughly performed and the disease in many localities was completely extirpated. In Denmark, for example, the practice was so effectively enforced that in 1826 there had not been a case of smallpox for eleven years. It was then reintroduced by a traveler from Hamburg. In Sweden the mortality dropped from an average of 2,045 deaths a year to 480. In Vienna in 1800, the deaths from smallpox for ten years had averaged 835 a year. After the enthusiastic introduction of vaccination in 1801, the deaths fell during the four fol-

lowing years to 164, 61, 27, and 2 respectively.

A hundred years remove from smallpox and its horrors has rendered the people more or less ignorant and consequently indifferent. During the past winter vaccination was extensively performed in New York. I was amazed to find among my private patients alone fourteen who had never been vaccinated. Most of these had come more or less recently from villages or country localities, which led me to infer that vaccination outside the larger cities has in recent years been much neglected.

It is well to state as definitely as possible what is to be expected from vaccination, for there is much popular misapprehension upon this point. For this purpose we cannot do better than to quote the words of Jenner, whose claims for vaccination, though always positive, were judicious and by no means extravagant. His own words were: "Duly and efficiently performed, it will protect the constitution from subsequent attacks of smallpox as much as that disease itself will. I never expected that it would do more, and it will not, I believe, do less," Shortly before his death he said: "My opinion of vaccination is precisely as it was when I first promulgated the discovery."

It is thus seen that no exaggerated claim was made by Jenner, nor has it been made by any judicious physician.

Vaccination is not expected to protect from smallpox more than will the disease itself. Any infectious disease is occasionally repeated in the same individual. In smallpox second attacks are not very uncommon. Marson saw 47 second attacks among 5,982 smallpox

patients. Haeser states that in Verona 24 cases of second attack were observed within 10 years, and Hein reports 57 cases occurring in Wurtemberg between 1831 and 1835. This means that the period of immunity is not always lifelong. A limited period of immunity is common to several of the infectious diseases. In diphtheria, for instance, immunity continues but a few weeks. In smallpox, while in some cases it is lifelong, in others it is limited. It is to be expected, therefore, that the immunity conferred by vaccination may have its limits and it is not a valid argument against the procedure that it must be performed more than once.

Jenner studied the subject with which his name is so intimately associated with the minutest care, and was a master of it in all its details. His ideas were clear and well defined, and the system was complete when it was given to the world. Upon one essential point only was he in error. He believed that vaccination thoroughly and properly performed would insure immunity for life. This was not unnatural, for he saw absolute immunity conferred by the operation and it required many years of observation to demonstrate that such immunity might not be perpetuated during the life of the individual.

The first attempt to check the ravages of smallpox was by means of inoculation. The idea was derived from the Levant, where the system had long been practised. It consisted in inoculating the subject with virus from a smallpox patient. It is a fact that the disease produced by such inoculation is usually less serious than that acquired by ordinary exposure, and the deathrate is

usually much lower. Still the death-rate is considerable. It seems strange at first thought, therefore, that the operation did not result in good. The patient was as dangerous to others as was the one with the regular disease and, hence, each case formed a new focus of infection. Many cases ran such a mild course that the patients could not be properly restrained, and proved a public danger. As a result of these causes, therefore, the system of inoculation instead of diminishing, probably resulted in actually increasing the frequency of the disease in England. It must be said, however, that the attempt to limit it by this means was entirely proper and legitimate and the results of actual experience could hardly have been foreseen.

The first vaccination of a human subject was performed by Edward Jenner on May 14, 1796. He had long been studying the question, which had been called to his attention by the fact that the milkmaids of certain districts of England rarely contracted smallpox. It was a matter of popular, though local observation, that the immune persons who had not had smallpox had been inoculated by cowpox. Little James Phipps was the first subject. His vaccination ran a typical course, and six weeks later a second vaccination, as Jenner had confidently predicted, produced not the slightest effect. After other unsuccessful trials, the boy was taken through a smallpox hospital without the slightest harm, as we of the present day can readily believe.

Two years later Jenner published his observations in a little book of 75 pages, entitled "An Inquiry into the Cause and Effects of the Variolæ Vaccinæ, a Dis-

ease Discovered in Some of the Western Counties of England, Particularly Gloucestershire, and known by the name of the Cowpox." The importance of this little volume, and its epochmaking character, is proof that the reputation of an author or scientist rests not upon *how much*, but upon *how good* his work is.

From the publication of this little book the adoption of vaccination was very rapid, and it soon spread over the civilized world. Its enemies, to be sure, were many and venomous. The system was opposed by many physicians, and was denounced from many pulpits with great bitterness, as an attempt to bestialize the race. It, however, made headway in spite of all opposition. The first vaccination in America was performed in Boston, on July 8, 1800, by Dr. Benjamin Waterhouse, Professor of Practice of Physic at Harvard. He vaccinated seven of his own children, six of the vaccinations being successful. Shortly afterward three of the children were sent to the smallpox hospital and one was inoculated with smallpox. None of the three, it is needless to say, contracted the disease. The first vaccination in New York was performed by Dr. Seamon, in May, 1801. The operation was introduced into the Southern States through the personal efforts of Thomas Jefferson, then President, who fully understood the ravages of the disease among the black population.

Jenner vaccinated all who came to him. There were sometimes 300 waiting at his door. He would have become impoverished had it not been for liberal grants by Parliament. He sent out lymph to the ends of the world, and carried on a wide correspondence. He be-

came, in his own words, "Vaccine clerk to the world." He died on January 26, 1823, and was buried in the village church, the offer of a grave in Westminster Abby having been declined by his family. He was modest and fond of a quiet life and simple pleasures; a man of great practical sagacity as well as originality of mind.

The faith in vaccination and the honor in which Jenner was held by his own generation, who understood smallpox so well, is shown by the fact that Parliament twice voted him grants of money amounting to £30,000, while Napoleon, the bitter foe of the English, liberated prisoners at his request.

To comprehend what vaccination has done for the world, we must understand what smallpox was when Jenner announced his great discovery. Its extreme contagiousness, its excessive rate of mortality, its loathsome character, and the maiming and disfigurement it left behind combined to make it the most serious scourge from which the race has suffered. It has been justly described as "the Attila of diseases, the very scourge of God, overrunning countries and destroying whole populations." When Jenner performed his first vaccination in 1796, smallpox was causing one-tenth of all the deaths of the human race. Bernouilli, the mathematician, estimated that more than 60,000,000 of the inhabitants of Europe died from smallpox during the eighteenth century, being an average of 600,000 a year. Others place the number even higher. Specific proof of its fatality is shown by Cowan's vital statistics of Glasgow. He states that between 1783 and 1792, 36 per cent. of all the deaths under ten years were

due to smallpox and between 1793 and 1802, 32 per cent. were due to that cause. These are no uncommon figures, for it was asserted by others that one-third of all deaths under ten years were due to smallpox. It was estimated by Condamine that this foul disease destroyed or disfigured the fourth part of mankind.

When the smallpox was introduced into Mexico by the Spaniards in 1520, 3,500,000 died within a few years. In 1737, 70 per cent. of the people of Greenland died of smallpox. In 1707, in Iceland, 18,000 in a population of 50,000 died in a single year. It is believed that 6,000,000 North American Indians fell victims to its ravages. It has done more to exterminate the aborigines of this continent than any other cause. In 1837 the destruction of life was enormous, whole tribes being exterminated.

Among half-civilized nations the appearance of smallpox often caused the abandonment of whole towns, the sick being left to their fate. The capital of Thibet, for example, was at one time left without inhabitants for several years after a visitation of the disease. In the present century, Cerea, in Brazil, was visited by smallpox, and in a population of 70,000 there were 40,000 victims.

Among civilized nations the ravages were almost equally great. It attacked every class and order, from the peasant to the king. It wrought wholesale havoc among royal families, notably those of England and Austria. When Louis XV. of France died of smallpox the corpse was deserted by every one except a few priests, who were detailed and enforced to perform the last rites. The disease had a marked influence not only upon the history of nations but in modi-

ying the character and habits of life of the people.

Macaulay refers frequently to smallpox in his "History of England," and in the fifth volume thus speaks of it: "That disease over which science has achieved a succession of glorious and beneficent victories was then [in the last years of the seventeenth century] the most terrible of all the ministers of death. The havoc of the plague had been far more rapid, but the plague had visited our shores only once or twice within living memory. The smallpox was always present, filling the churchyard with corpses, tormenting with constant fears all those whom it had not yet stricken, leaving on those whose lives it spared the hideous traces of its power, turning the babe into a changeling at which the mother shuddered, and making the eyes and cheeks of the betrothed maiden objects of horror to her lover."

"If a modern traveler," says Dr. Hyde, "could be transported to London in the early part of the present century, no peculiarities of architecture, dress, or behavior would be so conspicuous as the enormous number of pockmarked faces he would encounter at every turn." The comparative frequency of pockmarked faces is shown by the following description of a criminal issued by the London police authorities in 1688: "Thomas Bayly, a short, burly man, fair and fresh-colored, without pock-holes, flat-nosed, under 40 years old, commonly wears a fair perriwig, and useth a blue as well as a red coat."

Writing in 1747, Dr. Black said: "Very few of the human species escape the smallpox, especially in populous cities and towns wherein there is always last-

ing variolous fuel * * *. A mere handful of the native progeny of the metropolis can be supposed to have escaped an infection with which they are constantly enveloped."

One hundred years ago, smallpox was the most widely spread disease which affected the human race. To-day many physicians of large experience have never seen a case. Communities of thousands of inhabitants pass months and even years without its occurrence. No sane person of adult years can read history without believing that some marvelous power has been at work to produce this change. What else can it have been but vaccination?

It will surprise many to know that in former times smallpox was essentially a disease of childhood, over 80 per cent. of all cases occurring in children under five years. As vaccination is done chiefly in infancy and childhood, it is a strong proof of its efficacy that the occurrence of the disease has been transferred from childhood to adult life, when immunity has been exhausted.

Let us now consider the history of smallpox since Jenner's time and compare it with previous conditions. In England, it has been estimated that in 1660 the average annual number of deaths per million from smallpox was 4.170. Dr. Farr estimated the rate per million at 4.260 for the 30 years from 1728 to 1757. Official registration of the causes of death began in 1838. From that year to 1854, a period of optional vaccination, the average rate per million was 430. From 1854 to 1894, a period of enjoined vaccination, the rate for the whole period was 140. From 1872 to 1894, the laws were more rigid, and the

rate was 86. Excluding the epidemic of 1872, it was but 53. In the 14 years preceding 1872, the average deathrate from smallpox in the British army per 100,000 strength was 11.1; for 22 years after that date, 3.7. This was rendered even higher by the loss in 1889 of 23 men in India. In 1895, in a population of over 4,000,000, there were 55 deaths from smallpox in London. With less than one-fourth that population, Sir J. Simon states that during the eighteenth century the annual smallpox deathrate of London ranged from 3,000 to 5,000.

Sweden furnishes some particularly valuable facts, for excellent records have been kept since 1774. Between 1774 and 1801, the average smallpox mortality per million living was 2,045. During 15 years (1802 to 1816) of optional vaccination the average mortality was 408, and for 77 years of compulsory vaccination it averaged 155. During the 10 years from 1884 to 1893 (the latest record I can obtain), under still more rigid laws, there was no year in which the rate per million was above 5; it was in one year as low as 0.2. In the 28 years before 1801, the rate was over 1,000 in 18 different years, reaching in 1779 the enormous figure of 7,196. Since 1801, it has been below 100 in 46 different years, and below 10 in 15 different years.

Attempt has been made by antivaccinationists to minimize the value of these remarkable figures by the theory that there was a natural decline in smallpox before vaccination had been adopted. The facts are, however, that vaccination was taken up in Sweden with the utmost enthusiasm. It is known that in 1802, 80 physicians had lymph in their possessions. In 1804, royal orders required vaccination

by means of the pastors of churches, while in the following year the Royal College alone reported 25,000 vaccinations. It certainly requires great credulity to believe that the rapid fall in the mortality rate from 2,045 to 480 was due to a change in the character of the disease.

Prussia also affords some most convincing evidence of the efficacy of vaccination. The Prussian army was the first place where vaccination was required on a large scale. It was begun in 1834 and during the next 14 years there were but 77 cases of smallpox and varioloid, and not one death. In 1843 an epidemic of smallpox occurred in Prussia, but in the army there were but 12 cases. During the Franco-German war the German troops, about 1,000,000 in number, were well vaccinated and but 459 deaths occurred from smallpox. In the imperfectly vaccinated French army, on the other hand, though smaller in size, there were 23,400 deaths from that disease. It should be understood that the troops from the other states making up the German army of that time were not so thoroughly vaccinated as were those of Prussia, but all were vastly better vaccinated than the French.

Since 1874 a much more rigid vaccination law has been in force in Germany. Vaccination of all infants is made compulsory with revaccination of all at school age. The mean deathrate from smallpox per million before this law was 309. Since the law was passed it has been 15; during the last ten years, 7. In the army in which the vaccination law is most rigidly enforced, there has been but one death from smallpox since 1874. The general rate has never raised materially since that year. The cases

that have occurred have been largely upon the frontier and among foreigners.

These figures from Prussia have given the antivaccinationists much perturbation of spirit. They have been able to get around them only by actual untruth, in asserting that the law of 1835 was a compulsory vaccination law. That law urgently recommended vaccination but did not make it compulsory. Such a law was passed only in 1874. The antivaccinationists have tried to explain the diminished deathrate here, as in Sweden, upon the ground of improved sanitation. The argument is absurd. There was no sudden improvement in sanitary conditions in either country, and Prussia and Sweden are not more sanitary than other countries where there has been no such radical change either in the occurrence or the mortality of smallpox.

In Austria vaccination is not compulsory, and there we find some striking facts of different character. During the years in which the deathrate from smallpox in Prussia were seven, in Austria it was 458. In Belgium, another country in which vaccination is not compulsory, the deathrate per million from 1875 to 1884 was 441, when Prussia's was 22. Are we to infer that Prussia is just 20 times more sanitary than Belgium? In the year 1886, the deathrate from smallpox of Switzerland was fifty-fourfold that of Germany; that of Belgium forty-eightfold; Austria, eighty-onefold; and Hungary, six-hundred-and-sevenfold.

In Italy registration of causes of death was initiated in 1881. A compulsory law of vaccination in infancy and revaccination of all the children attend-

ing public schools was instituted in 1888. The smallpox deaths per 100,000 inhabitants from 1881 to 1890 averaged 35.5, being, during but two years, below 20. From 1891 to 1894 the average was 6.5.

In the four great capitals of Europe, in the ten years from 1877 to 1886, the smallpox deaths per 100,000 living were as follows: Vienna, 67; Paris, 28; London, 25; Berlin, 1.

In several localities in England a strong antivaccination sentiment had arisen, and by the irony of fate these towns furnish some very wholesome lessons. In the Sheffield epidemic of 1887-'88, we have the following statistics given by the *Practitioner*:

Attack-rate per 1,000 in the nonvaccinated, 94; deathrate, 51.

Attack-rate per 1,000 in the once vaccinated, 19; deathrate, 1.

Attack-rate per 1,000 in the revaccinated, 3; deathrate, 0.08.

One in 1,300 of the vaccinated died; one in 20 of the unvaccinated.

In Gloucester the antivaccination sentiment had been particularly strong, and in the epidemic of 1895-'96 there were 1,979 cases and 439 deaths in a population of 42,000. Strenuous attempts were made to stay the epidemic by means of hospitals, disinfection, and quarantining without the slightest effect. It raged unchecked until officials, who had publicly and boastingly declared themselves opposed to vaccination, became panic-stricken and, turning directly about, began to enforce the vaccination laws. The epidemic was then rapidly quelled.

Statistics derived from armies are of particular value, for there is no chance for the concealment of cases which fre-

quently occurs in civil life. Every case of disease as well as every death is known. Beginning with 1874, the average annual deathrate per 100,000 strength in various armies was as follows: French army for 8 years, 15; Austrian army for six years, 26; British army for 22 years, 3.7; Prussian army, 1 solitary death from 1874 to 1896. I have not been able to obtain the statistics since that year. As already stated, vaccination is more thoroughly carried out in the Prussian army than among any other body of men, the British army standing next.

Smallpox hospitals also furnish their evidence of the efficacy of vaccination. Dr. William M. Welch, in an experience of twenty-five years as physician to the Municipal Hospital of Philadelphia, reports that no physician, nurse, or employe of that institution, vaccinated before beginning duty, ever contracted smallpox. Dr. Marson, physician to the London Smallpox Hospital, said: "In 35 years I have never had a nurse or servant with smallpox; I revaccinate them when they come here." In his classic article based upon observations made upon 5,982 patients, he reports a mortality of 35.55 per cent. in patients never vaccinated and 5.25 in those who had been vaccinated and showed a scar. Among those alleged to have been vaccinated but showing no scar 21.75 per cent. died. Of all the patients who had been vaccinated with and without a scar, the operation had been done before 5 years of age in 90 per cent. He reports 47 second attacks of smallpox.

Dr. Collie says that during the epidemic of 1871, out of 110 smallpox attendants at Homerton, all but two were

revaccinated and those two alone took smallpox. MacVail collected statistics of 1,500 smallpox attendants, 43 of whom had smallpox, but not one of the 43 had been revaccinated. Dr. Bracken, of Minneapolis, has this year reported 662 cases of smallpox, but 10 having ever been vaccinated. Of these 10, 20 years or more had elapsed since the vaccination in seven.

The Chicago Board of Health has recently made the following statement: "Out of a total of 171 cases of smallpox found in Chicago between November 30, 1900, and April 10, 1901, 140 had never been vaccinated. Of the remaining 31 cases, 29 were adults, showing faint, poor, or irregular scars, claimed to be evidence of attempted vaccination in infancy or childhood—the most recent being 23 years old. Only two out of the 171 cases exhibited scars of successful vaccination."

Vaccination was made compulsory in the Chicago schools in 1867. From 1867 to 1881, there were but 17 cases of smallpox. After 1881 there was not a single case until last winter, when four cases developed. These children had been passed on fraudulent certificates, as neither of them could present a scar.

In St. Paul, between May 1, 1899, and May 10, 1901, there were 104 cases of smallpox. Of these, but two had ever been vaccinated, one 15 and one 20 years before. Dr. P. M. Hall, of Minneapolis, treated 191 cases between January 7 and May 8, 1901. In one only could signs of vaccination be found. Individual experiences of this character could be quoted indefinitely.

The statement is frequently made that

smallpox has become a much milder disease than it formerly was and that vaccination, therefore, is less necessary. Facts certainly do not bear out this statement. It is quite true that during the recent epidemic the deathrate has been extremely low and the illness has been mild. It has, however, not been universally so. It is true of all epidemic diseases that the prevailing type varies considerably in different years and smallpox has certainly not shown itself of late in its most virulent forms. Another factor must be considered as accounting for this mildness. It is noticeable that the term varioloid is now but seldom used. All attacks are called smallpox, a tendency to be commended. It remains true, however, that a great number of cases have been reported as smallpox which in the past would have been described as varioloid. In those who have never been vaccinated, the disease in most epidemics is almost if not quite as dangerous as it ever has been. In the London Smallpox Hospital, between 1775 and 1800, all patients of course being unvaccinated, the mortality rate was 32.5 per cent. In 1853 Marsden found that the rate for the previous 16 years was 35.55 for the unvaccinated. In a recent study of smallpox, Welch reports 1,512 cases in unvaccinated persons, with a deathrate of over 58 per cent. In young children the rate was much higher than this. Hart gives the deathrate of unvaccinated patients as fully 40 per cent. In the Sheffield epidemic of 1887, the deathrate was 54.2 per cent. In the Gloucester epidemic it was 22.3 per cent. for all cases of smallpox and varioloid.

The statement sometimes heard that

scarlet fever is as dangerous as smallpox is unwarranted. After an extensive study of American and European cases, Holt states that the general deathrate of scarlet fever is from 12 per cent. to 14 per cent., and 20 per cent. to 30 per cent. under five years. This is less than half the most favorable rate given for smallpox. The sequels of scarlet fever, though often grave, are not to be compared with those of smallpox. A hundred years ago two-thirds of the inmates of the blind asylums lost their sight from smallpox. Blindness, deafness, lung disease, tendency to tuberculosis, general ruin of the constitution, and personal disfigurement are the common results. In fact, the ravages of the disease cannot be estimated by the number it kills.

It is not in the province of this paper to discuss the accidents of vaccination, the variations in the normal clinical course, the technic of the operation, or many other points of interest. For an extended discussion of these various questions, the reader is referred to the recent admirable paper by Fielder. It is sufficient to say that tuberculosis and specific blood diseases are not conveyed by animal lymph. In fact, no disease, except vaccinia, is conveyed by the lymph as prepared to-day by reputable makers. Accidents are the result of extraneous germs. Their introduction occasionally results from lack of care in performing the operation, but more often improper care or injury after it is performed. Vaccination should be done with surgical cleanliness. The sore may become infected like any other abrasion of the skin and requires adequate care. The patient should be directed that tearing off of the scab or any other

serious injury to the sore should be reported at once to the physician. Should the sore have become infected and purulent, it should be cleaned out and treated like any other infected wound. It cannot be denied that vaccination sores have sometimes become infected, with results more or less serious to the patient. Infection by erysipelas is particularly to be dreaded. With adequate care in selecting the vaccine, in performing the operation, and in after care, complications are so rare as to furnish no rational grounds for objection to vaccination.

In writing this paper, I have had no intention of producing a scare, or of adding to the feeling of apprehension which seizes a community upon the beginning of an epidemic of smallpox. On the contrary, I have attempted to show that apprehension and "scare" are entirely unnecessary to those who are adequately vaccinated. By showing the seriousness of smallpox and the efficacy of vaccination, I have hoped to increase in a slight measure its more general performance. Under our form of government, it seems almost impossible to hope that compulsory vaccination will ever be attained. The dread of abridging the personal liberty of the few, often leads us into neglecting the rights of the many. It is only by persistently educating succeeding generations that anything like adequate vaccination of the community at large will be accomplished. It seems also that the lesson must occasionally be enforced by the bitter experience of a more or less fatal epidemic.

Experience of more than a century has confirmed and strengthened the teachings of Jenner, except upon the single point of the duration of immunity. Some of the

lessons taught by this experience may be summarized as follows:

1. The first lesson cannot be better stated than in the words of the Berlin Board of Health: "Vaccination in infancy, renewed at the end of childhood, renders an individual practically as safe from death from smallpox as if that disease had been survived in childhood, and almost as safe from attack."

2. The duration of the immunity conferred by vaccination is variable. In many individuals vaccination in infancy, and revaccination in childhood is sufficient for life protection. In a limited number, immunity is lost in five or six years. It is never possible to know with certainty to which class an individual belongs. In the face of an epidemic, therefore, vaccination of all who have not been vaccinated within five or six years, is giving what the lawyers call the benefit of a reasonable doubt. Every one who has been vaccinated in infancy and childhood, should be vaccinated not less than once in adult life.

3. The immunity conferred by vaccination is in direct proportion to the thoroughness with which it is performed, and this is shown with considerable accuracy by the character and number of the resulting scars.

4. Vaccination in infancy alone is not sufficient to wholly prevent smallpox among the adult population.

5. Optional vaccination has not proved sufficient to protect the community from smallpox. Compulsory vaccination is a measure warranted by more than a century of experience.

6. The mild compulsion enforced in this country, by requiring vaccination or evidence of its recent performance upon

admission to the public schools should have the hearty support of parents and physicians alike.

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A VACCINATION CREED has been widely circulated in Chicago by the Department of Health, and it has been of the greatest service, Dr. Reynolds says, to the public vaccinators in arousing interest in the subject of vaccination among classes peculiarly exposed to smallpox. The plan is worthy of imitation. The "creed" reads as follows:

We, the undersigned, hereby publicly profess our firm belief—based upon positive knowledge, gained through years of personal experience and study of smallpox and vaccination—

1. That true Vaccination—repeated until it no longer "takes"—ALWAYS prevents smallpox. NOTHING ELSE DOES.

2. That true Vaccination—that is, vaccination properly done on a CLEAN arm with PURE lymph and kept perfectly CLEAN and UNBROKEN afterward—never did and NEVER WILL make a serious sore.

3. That such a Vaccination leaves a characteristic scar, unlike that from any other cause, which is recognizable during life and is the ONLY conclusive evidence of a Successful Vaccination.

4. That no untoward results ever follow such Vaccination; on the other hand, thousands of lives are annually sacrificed through its neglect—a neglect begotten of WANT OF KNOWLEDGE.

A SUPPLEMENT TO THE VACCINATION CREED for popular distribution, has also been issued by Dr. Reynolds, of the Chicago Department of Health. We quote some of its sentences:

Not one of the 346 cases of smallpox discovered in Chicago within the last three years was found vaccinated as defined in the Vaccination Creed.

Of the total number, 306 never had been vaccinated at all, though most of them claimed that they had. Examination of the arms proved that these attempts at vaccination were failures; there was no scar and the patients finally admitted that the vaccinations when per-

formed did not "take." A "failure" is not a vaccination; therefore, these 306 cases had never been vaccinated.

Of the remaining 40 cases, 26 had old, irregular and doubtful scars said to be the result of vaccination; but these were not characteristic; they were more like the scars from infected sores or wounds than those from vaccine. Nine had fair old scars of vaccinations made from 30 to 40 years previously. Only five had typical (characteristic) scars; but these also were the results of vaccinations made many years before and never repeated. * * *

These 346 persons are examples of thousands of others who honestly believe they have been vaccinated, because they have had their arms scratched, something rubbed in and a more or less painful sore has resulted. There is no operation so simple and so safe as vaccination when properly performed and cared for. There is no operation in which such serious results follow carelessness and ignorance—even unto death itself, either as a direct result through poisoning of the vaccination sore or from smallpox through failure to secure a successful protective vaccination. * * * The arm should be first thoroughly washed with soap and water and the site of the operation then wiped with alcohol. After the vaccine spot has dried, pin a clean soft handkerchief or piece of clean soft muslin to the shoulder-seam of the undershirt so as to hang in loose folds over the spot and prevent the sleeve from rubbing it. This must be changed for a clean one every day until the scab comes off and the surface is healed. The vesicle and resulting scab must not be

broken or injured in any way and the arm and its coverings must be kept scrupulously clean from the time of the vaccination until it is well. * * * The rule is—repeat vaccination until the susceptibility to vaccine is exhausted. When this is done it is impossible to contract smallpox. This is the protection given the employees of the Department of Health who handle and nurse smallpox patients and bury the dead from the disease, and in no instance, among the hundreds so employed, has any one of them ever contracted smallpox.

SOME VACCINATION STATISTICS OF ENGLISH CITIES were given by Dr. Bond at a recent meeting of the Hunterian Society. In the term "vaccinated" were included all showing any evidence whatever of vaccination, a very liberal allowance. The figures are epitomized in the following table:

	Under 10 years of age.			
	Vaccinated.		Unvaccinated.	
Total number cases of smallpox.	Number.	Number of deaths.	Number.	Number of deaths.
	Deathrate.		Deathrate.	
London, 1801—1960	5,166	125	672	153
Leicester, 1802—1803	4,527	—	107	15
Sheffield, 1887—1888	4,703	363	228	100
Warminster Union, 1891—1892	1,123	44	1	15
Dewsbury, 1892—1893	1,677	33	2	12
Gloucester, 1895—1896	1,479	26	1	37
Gloucester, 1892—1893	1,477	26	1	32
Gloucester, 1892—1893	1,477	26	1	32
Oldham, 1892—1893	865	11	680	56
Oldham, 1892—1893	124	3	136	7
Leeds, 1892—1893	200	4	35	6
Leeds, 1892—1893	200	4	8	3
Halifax, 1892—1893	330	4	38	15
Bradford, 1893	658	17	57	23
Totals	16,018	622	10	668
			1.6	2.047
				32.6

Review of Diseases for January, 1902.**EIGHTY-EIGHT COUNTIES REPORTING.**

Ninety-four counties have Superintendents of Health.

Except in the case of the more contagious and dangerous diseases the Superintendent has, as a rule, to rely upon his own information alone, since few physicians can be induced to report cases of non-contagious diseases to him.

Where the number of cases is not given or the prevalence of a disease otherwise indicated, its mere presence in the county is to be understood as reported.

For the month of January the following diseases have been reported from the counties named:

MEASLES.—Beaufort, 2; Brunswick, many; Caswell, 50; Cleveland, a few; Columbus, a few; Cumberland, several; Durham, many; Hyde, 5; Iredell, a few; Jones several; Lenoir, 1; Macon, in all parts; Mecklenburg, 8; Moore, a few; New Hanover, 3; Person, a few; Polk, 2; Randolph, in all parts; Richmond, many; Scotland; Surry, 8; Vance, a few; Washington, 2—23 counties.

WHOOPING-COUGH.—Beaufort, 2; Bertie, many; Caswell, 25; Dare, 12; Duplin; Durham; Granville, 2; Harnett, a few; Hertford, 4; Hyde, 100; Lenoir, 1; Moore, a few; Northampton, many; Orange; Pasquotank, 2; Person, a few; Polk, 2; Randolph, in all parts; Richmond, many; Rockingham; Rutherford, a few; Sampson, several; Vance a few; Wake, 21—24 counties.

SCARLET FEVER.—Buncombe, 3; Caswell, 4; Catawba, 1; Craven, 1; Durham, 6; Gaston, 2; Granville, 7; Guilford, 1; Haywood, 6; Henderson, 2; Madison, 6; Polk, 2; Swain, 3; Wake,

3; Warren, 2; Watauga, a few; Yancey, a few—17 counties.

DIPHTHERIA.—Brunswick, many; Catawba, 1; Cleveland, a few; Craven, 2; Durham, a few; Haywood, 2; Lenoir, 1; Lincoln, 1; Mecklenburg, 4; New Hanover, 2; Rockingham; Rutherford, 2; Vance, 1; Wake, 1; Watauga, a few; Wayne, 1—16 counties.

TYPHOID FEVER.—Caldwell, 3; Caswell, 3; Catawba, 3; Chatham, 1; Columbus, 3; Graham, 3; Harnett, a few; Iredell, many; Jones, 3; Polk, 2; Rockingham; Scotland, 1; Stanly; Stokes, 3; Vance, a few; Wake, 3; Wilkes, 1; Wilson, 1—18 counties.

MALARIAL FEVER.—Craven; Hertford; Martin; New Hanover; Pasquotank; Perquimans; Wilkes—7 counties.

MALARIAL FEVER, PERNICIOUS.—Wilkes, 2.

MALARIAL FEVER, HEMORRHAGIC.—Craven, 1; Hertford, 1; Martin, 2; New Hanover, 1; Pasquotank, 1; Perquimans, 1—6 counties.

INFLUENZA.—Alamance, general; Alexander; Anson, general; Bladen; Burke, general; Caswell; Catawba; Cleveland; Columbus; Currituck; Davidson; Greene; general; Haywood; Iredell, general; Jackson, a few; Lenoir; Lincoln, Martin, general; Montgomery; New Hanover, general; Northampton; Onslow, general; Pender; Randolph, Richmond, general; Stanly; Transylvania; Vance; Wake, general; Warren—31 counties.

MUMPS.—Caldwell, in all parts; Catawba; Person, a few; Rockingham, in all parts; Sampson, 1; Washington—6 counties.

PNEUMONIA.—Burke, in all parts; Caldwell; Chatham; Currituck; Davidson; Davie; Franklin, a few; Gaston,

several; Granville; Harnett, in many parts; Iredell, in all parts; Jackson, a few; Lenoir; Lincoln, in all parts; McDowell; Martin, in all parts; Montgomery, many; Moore, in all parts; Northampton; Pender; Perquimans, 12; Person, a few; Polk, Randolph, Richmond, in all parts; Sampson; Scotland; Stanly; Stokes, in most parts; Vance; Wake, in all parts; Warren—22 counties.

VARICELLA.—Graham; Lenoir; Washington.

SMALLPOX.—Buncombe, 48; Cabarrus, 27 “among negroes;” Cleveland, 1; Cumberland, 1; Duplin, 25 or 30; Edgecombe, 1; Forsyth, 20; Gaston, 10; Greene, 7; Henderson, 3, “stamped out now” (Feb. 3); Lenoir, 3; Madison, 7; Martin, 1; Mecklenburg, 35; Nash, 1; Polk, 7; Rockingham, 7; Rutherford, 1; Sampson, 33; Stanly, 10 or 12, “all negroes but one, two cases very severe”; Surry, 1; Union, 1; Wayne, 7, “all now well” (Feb. 1); Wilson, 156, “one death reported, one other heard of, the rest now well except eight or ten” (Feb. 3)—24 counties.

CHOLERA, IN HOGS.—Alexander, Anson, Caswell and Columbus.

DISTEMPER, IN HORSES.—Burke.

STAGGERS, IN HORSES.—Beaufort, Currituck, Hyde, Northampton and Pasquotank (?)

No diseases reported from Carteret, Chowan, Clay, Johnston and Yadkin.

No reports received from Alleghany, Ashe, Cherokee, Gates, Halifax, Mitchell, Pitt, Robeson and Rowan.

Summary of Mortuary Reports for January, 1902.

(TWENTY-EIGHT TOWNS).

	White.	Col'd.	Total.
Aggregate population.....	93,170	62,200	155,370
Aggregate deaths.....	115	104	219
Representing temporary annual death rate per 1,000.....	14.7	20.1	16.8
<i>Causes of Death.</i>			
Typhoid fever.....	3	0	3
Malarial fever.....	0	2	2
Diphtheria.....	0	1	1
Whooping-cough..	0	1	1
Pneumonia.....	27	27	54
Consumption.....	13	11	24
Brain diseases.....	9	5	14
Heart diseases.....	5	9	14
Neurotic diseases...	5	2	7
Diarrhœal diseases	1	1	2
All other diseases..	49	38	87
Accident.....	3	5	8
Violence.....	0	2	2
	115	104	219
Deaths under five years.....	25	22	47
Still-born.....	6	8	14

Mortuary Report for January, 1902.

TOWNS AND REPORTERS.	RACES.	POPULATION.		TEMPORARY ANNUAL DEATH RATE PER 1,000.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrheal Diseases.	All Other Diseases.	Accident.	Suicide.	TOTAL DEATHS.			
		By Races.	Total.	By Races.	Total.																By Races.	By Towns.	Deaths under five years.	Still-born.
Asheville	W.	10,000	14,800	14.4	18.4	1	1	1	1	1	1	3	1	1	1	1	1	4	2	12	12	23	1	1
Dr. C. V. Reynolds.	C.	4,800		27.5														5	1	11		6	1	
Charlotte	W.	11,000	18,200	14.2	14.5							7	1	1	1	1	1	6	1	13	13	22	2	2
Dr. F. O. Hawley.	C.	7,200		15.0								3	1	1	1	1	1	4	1	9	9	3		
Durham	W.	10,000	*15,000	7.2	11.2							1	1	1	1	1	1	5	1	6	6	14	12	
Dr. N. M. Johnson.	C.	5,000		19.2								2	1	1	1	1	1	4	1	8	8	14	12	
Edenton	W.	1,000	3,100	24.0	27.1							1	1	1	1	1	1	1	1	5	5	7		
Dr. T. J. Hoskins.	C.	2,100		28.6								1	1	1	1	1	1	3	1	5	5	7		
Fayetteville	W.	2,500	4,800	9.6	20.0							4	1	1	1	1	1	1	1	6	6	8		
Dr. John D. MacRae.	C.	2,300		19.6								4	1	1	1	1	1	1	1	6	6	8		
Goldsboro	W.	3,400	6,000	14.1	14.0							1	1	1	1	1	1	1	1	4	4	7	2	1
Geo. E. Hood, Mayor.	C.	2,600		13.8								1	1	1	1	1	1	1	1	1	1	7	1	1
Greensboro	W.	6,000	10,100	14.0	22.6							3	1	1	1	1	1	2	1	7	7	19	1	1
Jno. S. Michaux, C. C.	C.	4,100		35.1								3	1	1	1	1	1	5	1	12	12	19	2	1
Henderson	W.	2,300	3,800	5.2	22.1							1	1	1	1	1	1	1	1	1	6	7	2	
Dr. F. R. Harris.	C.	1,500		48.0								2	1	1	1	1	1	1	1	6	6	7	2	
Lenoir	W.	1,200	1,500	10.0	8.0							1	1	1	1	1	1	1	1	1	1	1		
Dr. A. A. Kent.	C.	300		0.0								1	1	1	1	1	1	1	1	0	0	1		
Lexington	W.	800	1,300	30.0	18.4							1	1	1	1	1	1	1	1	2	2	2		
J. H. Moyer, Mayor.	C.	500		0.0								1	1	1	1	1	1	1	1	0	0	2		
Mt. Olive	W.	400	700	0.0	0.0							1	1	1	1	1	1	1	1	0	0	0		
Dr. C. S. Maxwell.	C.	300		0.0								1	1	1	1	1	1	1	1	0	0	0		
Marion	W.	800	1,150	15.0	10.4							1	1	1	1	1	1	1	1	1	1	1		
Dr. B. A. Cheek.	C.	350		0.0								1	1	1	1	1	1	1	1	0	0	1		
Morganton	W.	1,500	2,000	16.0	24.0							1	1	1	1	1	1	1	1	2	2	4		
J. C. Estes, City Clk.	C.	500		48.0								1	1	1	1	1	1	1	1	0	0	1		
Oxford	W.	1,200	2,100	10.0	5.7	1	1	1	1	1	1	2	3	3	1	2	1	7	1	18	18	27	2	1
Dr. S. D. Booth.	C.	900		0.0								1	1	1	1	1	1	5	1	9	9	3	1	
Raleigh	W.	8,000	13,800	27.0	23.5							2	3	3	1	2	1	7	1	18	18	27	2	1
T. P. Sale, Clerk B. H.	C.	5,800		18.6								1	1	1	1	1	1	5	1	9	9	3	1	
Reidsville	W.	2,900	4,200	4.1	8.6							1	1	1	1	1	1	1	1	1	1	3		
Jas. T. Smith, Cy. Cl.	C.	1,300		18.5								1	1	1	1	1	1	1	1	2	2	3		
Rockingham	W.	1,500	2,000	32.0	24.0							3	1	1	1	1	1	1	1	4	4	4		
Dr. Wm. P. S. Webb.	C.	500		0.0								3	1	1	1	1	1	1	1	0	0	4		
Rocky Mount	W.	1,500	3,100	8.0	11.6							1	1	1	1	1	1	1	1	1	1	3	1	
Dr. G. L. Wimberley, Jr.	C.	1,600		15.0								1	1	1	1	1	1	2	1	2	2	3		
Salem	W.	3,300	3,650	32.7	29.6							3	1	1	1	1	1	6	1	9	9	9	2	
J. A. Vance, Mayor.	C.	350		0.0								3	1	1	1	1	1	0	0	0	0	9		
Salisbury	W.	3,900	6,400	18.5	16.9							3	1	1	1	1	1	2	1	6	6	9	1	
Dr. W. W. McKenzie.	C.	2,500		14.4								1	1	1	1	1	1	1	1	3	3	9	1	
Smithfield	W.	620	1,070	0.0	0.0							1	1	1	1	1	1	1	1	0	0	0		
J. C. Bingham, Mayor.	C.	450		0.0								1	1	1	1	1	1	1	1	0	0	0		
Southport	W.	900	1,400	13.3	8.6							1	1	1	1	1	1	1	1	1	1	1		
Dr. D. I. Watson.	C.	500		0.0								1	1	1	1	1	1	1	1	0	0	1		
Tarboro	W.	2,000	2,500	0.0	0.0							1	1	1	1	1	1	1	1	0	0	0		
Dr. L. L. Staton.	C.	500		0.0								1	1	1	1	1	1	1	1	0	0	0		
Wadesboro	W.	1,000	1,700	0.0	0.0							1	1	1	1	1	1	1	1	0	0	0		
Dr. J. H. Bennett.	C.	700		0.0								1	1	1	1	1	1	1	1	0	0	0		
Washington	W.	2,300	4,900	15.6	12.2							2	1	1	1	1	1	1	1	3	3	5		
Dr. Jno. G. Blount.	C.	2,600		9.2								1	1	1	1	1	1	1	1	2	2	1	2	
Weldon	W.	700	1,450	0.0	0.0							2	1	1	1	1	1	1	1	0	0	0		
J. T. Gooch, Mayor.	C.	750		0.0								2	1	1	1	1	1	1	1	0	0	0		
Wilmington	W.	10,600	21,100	14.7	18.2							2	1	1	1	1	1	8	1	13	13	32	4	1
Dr. Chas. T. Harper.	C.	10,500		20.8								7	1	1	1	1	1	6	1	19	19	32	4	1
Wilson	W.	1,850	3,550	32.4	33.8	1	1	1	1	1	1	2	1	1	1	1	1	1	1	5	5	10	3	
Dr. W. S. Anderson.	C.	1,700		35.3								2	1	1	1	1	1	2	1	5	5	10	3	

N. B.—The reporters for the cities and towns printed in **Black Type** have signed this certificate:

County Superintendents of Health.

Alamance	Dr. H. R. Moore.	Jones.....	Dr. S. E. Koonce.
Alexander	Dr. C. J. Carson.	Lenoir	Dr. C. L. Pridgen.
Alleghany	Dr. B. C. Waddell.	Lincoln	Dr. T. F. Costner.
Anson	Dr. J. H. Bennett.	McDowell	Dr. B. A. Cheek.
Ashe.....	Dr. J. W. Colvard.	Macon	Dr. F. L. Siler.
Beaufort	Dr. Jno. G. Blount.	Madison	Dr. Jas. K. Hardwicke.
Bertie	Dr. H. V. Dunstan.	Martin.....	Dr. W. H. Harrell.
Bladen.....	Dr. L. B. Evans	Mecklenburg.....	Dr. C. S. McLaughlin.
Brunswick	Dr. J. A. McNeill.	Mitchell.....	Dr. V. R. Butt.
Buncombe	Dr. E. B. Glenn.	Montgomery	Dr. M. P. Blair.
Burke.....	Dr. J. L. Laxton.	Moore.....	Dr. Gilbert McLeod.
Cabarrus.....	Dr. R. S. Young.	Nash	Dr. J. P. Battle.
Caldwell	Dr. A. A. Kent.	New Hanover	Dr. W. D. McMillan.
Camden.....		Northampton.....	Dr. H. W. Lewis.
Carteret	Dr. F. M. Clark.	Onslow.....	Dr. E. L. Cox.
Caswell	Dr. S. A. Malloy.	Orange.....	Dr. D. C. Parris.
Catawba	Dr. Geo. H. West.	Pamlico.....	
Chatham.....	Dr. H. T. Chapin.	Pasquotank	Dr. J. E. Wood.
Cherokee.....	Dr. J. W. Patton.	Pender.....	Dr. R. J. Williams
Chowan.....	Dr. T. J. Hoskins.	Perquimans	Dr. C. C. Winslow.
Clay	Dr. J. O. Nichols.	Person	Dr. J. A. Wise.
Cleveland	Dr. B. H. Palmer.	Pitt.....	Dr. C. O'H. Laughing-
Columbus.....	Dr. I. Jackson.		house.
Craven.....	Dr. N. H. Street.	Polk	Dr. Earle Grady.
Cumberland.....	Dr. Jno. D. McRae.	Randolph	Dr. S. A. Henley.
Currituck	Dr. H. M. Shaw.	Richmond.....	Dr. Wm. P. S. Webb.
Dare	Dr. W. B. Fearing.	Robeson.....	Dr. H. T. Pope.
Davidson.....	Dr. Joel Hill.	Rockingham	Dr. Sam Ellington.
Davie	Dr. James McGuire.	Rowan.....	Dr. W. L. Crump.
Duplin	Dr. O. F. Smith.	Rutherford.....	Dr. T. B. Twitty.
Durham	Dr. N. M. Johnson.	Sampson	Dr. R. E. Lee.
Edgecombe	Dr. L. L. Staton.	Scotland	Dr. A. W. Hamer.
Forsyth.....	Dr. John Bynum.	Stanly.....	Dr. V. A. Whitley.
Franklin	Dr. E. S. Foster.	Stokes	Dr. W. V. McCanless
Gaston.....	Dr. J. H. Jenkins.	Surry	Dr. John R. Woltz.
Gates.....	Dr. W. O. P. Lee.	Swain.....	Dr. J. A. Cooper.
Graham	Dr. R. Orr.	Transylvania	Dr. C. W. Hunt.
Granville	Dr. S. D. Booth.	Tyrrell.....	
Greene.....	Dr. Joseph E. Grimsley.	Union	Dr. John M. Blair.
Guilford.....	Dr. Edmund Harrison.	Vance.....	Dr. Goode Cheatham.
Halifax	Dr. I. E. Green.	Wake.....	Dr. J. J. L. McCullers.
Harnett.....	Dr. O. L. Denning.	Warren.....	Dr. A. S. Pendleton.
Haywood	Dr. S. B. Medford.	Washington	Dr. W. H. Ward.
Henderson	Dr. J. G. Waldrop.	Watauga.....	Dr. T. C. Blackburn.
Hertford	Dr. J. H. Mitchell.	Wayne.....	Dr. Williams Spicer.
Hyde.....	Dr. E. H. Jones.	Wilkes.....	Dr. W. P. Horton.
Iredell	Dr. Henry F. Long.	Wilson.....	Dr. W. S. Anderson.
Jackson.....	Dr. Wm. Self.	Yadkin	Dr. S. L. Russell.
Johnston	Dr. L. D. Wharton.	Yancey	Dr. J. L. Ray.

[You are asked to fill out and mail one of these forms to the Superintendent of Health of your county on or before the third of each month, that he may use it in making his report to the Secretary of the State Board.

Have any of the following diseases occurred in your practice during the month just closed. If so, state number of cases.

Whooping-cough ----- Typhoid Fever -----

Measles ----- Typhus Fever -----

Diphtheria ----- Yellow Fever -----

Scarlet Fever ----- Cholera -----

Pernicious Malarial Fever ----- Smallpox -----

Hemorrhagic Malarial Fever ----- Cerebro-spinal Meningitis -----

What have been the prevailing diseases in your practice?

Has any epidemic occurred among domestic animals? If so, what?

What is the sanitary condition of your section, public and private?

General Remarks: -----

----- M. D.

BULLETIN

OF THE

North Carolina Board of Health.

Published Monthly at the Office of the Secretary of the Board, Raleigh, N. C.

GEO. G. THOMAS, M. D., *Pres.*, Wilmington.
S. WESTRAY BATTLE, M. D....Asheville.
HENRY W. LEWIS, M. D.....Jackson.
J. L. NICHOLSON, M. D.....Richlands.

W. P. IVEY, M. D.....Lenoir.
FRANCIS DUFFY, M. D.....New Bern.
W. H. WHITEHEAD, M. D.....Rocky Mt.
J. L. LUDLOW, C. E.....Winston.

RICHARD H. LEWIS, M. D., *Secretary and Treasurer*, Raleigh.

VOL. XVI.

MARCH, 1902.

No. 12.

Biological Examinations.

We have been requested by the Biologist to make an earnest appeal to physicians who send specimens for examination to carry out the instructions for collecting, packing and shipping same, which are perfectly plain and explicit, exactly to the very letter. This request is rendered necessary by the fact that in several instances the conditions, the rigid observance of which is so necessary in such delicate work, have been totally violated.

We also beg to call attention once more to the following: Applications for examinations should be made to the Secretary of the Board of Health, who will endorse them to the Biologist, who will forward mailing case and instructions. In suspected diphtheria and for blood examinations application may be made to the county superintendent of health or municipal health officer, to save time, although we regret to say very few have

so far asked for the outfits promised in our last issue.

The specimens should be sent, not to the Secretary, but to Department of Agriculture, Division of Biology.

We announce once more that mailing cases and instructions for diphtheria and blood tests will be deposited with any county superintendent or medical health officer of a city or town asking for them.

Wanted, a Physician.

A physician is urgently needed in the Flat River section of Durham county. We are just in receipt of a letter from Mr. J. W. Umstead, Flat River, N. C., stating that the two physicians resident in that community have recently left, one to accept a government office and the other on account of ill health, and asking us to recommend some one. We take this method of bringing the matter to the attention of the profes-

sion, so that any one wishing to make a change to a good neighborhood can do so. Inquiries should be addressed to Mr. Umstead. An impartial opinion as to the character of the community from the practitioner's point of view could doubtless be obtained from the physicians of Durham.

Tetanus and its Toxines.

BY GERALD M. CARTHY, BIOLOGIST.

Tetanus or lock-jaw is a specific disease of the central nervous system clinically characterized by powerful spasms of the voluntary muscles. The disease is common to all warm-blooded animals of the vertebrate type, with exception of birds, which seem immune under natural conditions. The animals most susceptible are in the order given: guinea-pig, mouse, rabbit, horse, ass, man, sheep, dog and cow.

The cause of tetanus is a bacillus normally found in the superficial layer of rich, humous soils in warm climates, where the germ seems to play an important and useful but as yet unknown role in the economy of nature. The germ is usually absent from poor and arid soils.

The cause of tetanus is a bacillus normally found in the superficial layer of rich, humous soils in warm climates, where the germ seems to play an important and useful but as yet unknown role in the economy of nature. The germ is usually absent from poor and arid soils.

Bacillus tetanus is scientifically described as follows: A slender, straight, round-ended, motile, spore-bearing bacillus. The spores are formed at one end of the rod, giving the bacillus the appearance of a pin or nail. The bacillus is a strict anaerobe, *i. e.*, cannot grow in the presence of oxygen. It liquefies gelatine, grows at a temperature of 18 degrees C. to 38 degrees C. (65 degrees F. to 100 degrees F.). Spores are formed in wounds and in incubator culture within thirty hours. It grows in all standard culture media in absence of

oxygen. Stains easily in usual aniline colors and by Gram's method. Powerfully pathogenic.

In the living body the bacillus of tetanus behaves much like the bacillus diphtheriae. It does not circulate in the blood stream nor seek any particular internal organ. It seems to remain near the point of inoculation, where it elaborates within its cells a soluble poison or toxine, which being dissolved in the blood stream, seeks, or is especially attracted to, the nerve centers in the spinal cord, upon which it produces its characteristic effect. The period of incubation, or in other words, the time that must elapse between the inoculation or wound and the appearance of the spasms varies from thirteen hours in the guinea-pig to five days in the horse and six or seven days in the human subject. The suppuration usually accompanying tetanic wounds is not caused by this bacillus itself, but by certain micrococci which are commensals, and without whose assistance in removing oxygen from the wound the tetanus bacillus could not grow. The reason why ordinary wounds and bruises of the feet are not more frequently followed by tetanus is because the oxygen-consuming, pus-forming micrococci are much less common in soil than the tetanus bacilli.

The toxine, ferment or enzyme elaborated by the bacillus of tetanus is chemically an albumose of very complicated and unstable structure, but it is as yet little understood. It behaves as an enzyme, being destroyed in a few minutes by heat at 65 degrees C. (149 degrees F.) and at 55 degrees C. (131 degrees F.) in half an hour. Direct sunlight and free oxygen are rapidly fatal to it. It rapidly becomes inert after being filtered from the original culture. So extremely

poisonous is the fresh toxine that 0.00001 cubic centimeter or about 1-62,000 minim is sufficient to kill a mouse. When the active principle is precipitated from its solution and separated pure 0.000,000.05 grain will kill a mouse weighing fifteen grams or about one-half ounce. The fatal dose for a man is about 3-1,000 grain. These figures appear very close to the incomprehensible. They may serve however to show why a mere scratch or even the bite of an insect or the abrasion of a finger by the Fourth-of-July toy pistol often suffices to bring on this horrible disease. So rapid is the development of the toxine and so violent is its onset that if a mouse be inoculated at root of tail with a culture of the bacillus and the wound is burnt out or excised after one hour yet the animal will die with tetanic convulsions.

The tetanic toxine was first isolated by the German biologist, Brieger, in 1887. It is readily and easily prepared in the laboratory for experimental purposes by cultivating the bacillus in a two per cent. glucose broth in an atmosphere free from oxygen. A common way of preparing the toxine is to boil the sugared broth to drive out all oxygen. Plug tightly and cool on ice to 80 degrees C. Then inoculate with sporiferous material and keep at 80 degrees C. for one hour. Reduce to 38 degrees C. and cover the flask with melted paraffine. Keep it at 38 degrees C. for three weeks. At the end of this time filter through a Chamberland filter. The toxine must always be tested and its virulence standardized upon guinea-pigs. A common and desirable standard of strength is that in which 1-62 minim will kill a full-grown guinea-pig in fifteen hours. The virulence of the filtered toxine is very fugacious. It must be prepared fresh for every new experiment.

THE ANTITOXINE.

It is fortunate for human welfare that practically all pathogenic or toxic bacteria produce their own antitoxines. This knowledge is of comparatively recent date, but has already produced brilliant results, as in cases of diphtheria. Antitoxic or serum therapy has a great future, of which we as yet see but the first faint glimmerings. About 1890 the German biologist, Behring, and the Japanese Kitasato were studying the antitoxine of diphtheria and accidentally discovered that animals could be rendered immune to tetanus by being inoculated subcutaneously with a mixture of a culture of the bacillus and tetrachloride of iodine. Subsequently they found that the blood serum of an animal made immune in this way possessed the power of neutralizing the tetanus toxine in other animal bodies if the serum was injected along with or soon after the inoculation. Of the real nature of the antitoxine we know even less than we do of the toxine. It acts like an enzyme and is supposed by many biologists to be a weakened or transformed condition of the toxine itself. It is destroyed at a temperature of 65 degrees C. (149 degrees F). It is also destroyed by adding to the serum ten per cent. of hydrochloric acid.

The antitoxine of tetanus is now prepared on a commercial scale in large quantities. It can be procured of or through druggists. The following is the process that is commonly followed in producing the antitoxine:

The horse is the animal always selected. An animal which has spontaneously recovered from an attack of tetanus is preferred. A culture of the *bacillus tetani* is grown in glucose broth and the toxine filtered off and standardized to a strength that a 12-minim dose

will kill a rabbit in three days. One-half per cent. of glacial carbolic acid is added to the standard toxine as a preservative. The first injection of the toxine is 1 cubic centimeter. The dose is doubled at each succeeding injection. The injections follow as rapidly as the animal can stand them without distress, until in the course of a month or so the dose injected may be 300 cc. When a 300 cc. injection can be borne, with a hypodermic needle small samples of blood are drawn from the jugular vein of the horse and injected into guinea-pigs, which animals receive at the same time a dose of the standard toxines. The potency of the horse blood or serum should be such that 0.00001 cc. will protect a guinea-pig weighing fifteen ounces from a 0.01 cc. dose of the standard toxine injected at the same time. This strength is said to be 1-1,000,000. A serum having a strength of 1-5,000,000 is however easily produced and has some advantages over the weaker serum. The value of a serum is not in its bulk or cheapness but in its antitoxic potency. Physicians and veterinarians using antitoxic serums should beware of cheap, low grade products which, as has been recently shown in case of antidiphtheritic serum made at the St. Louis Alms-house, is liable to be contaminated and cause blood poisoning, or worse. The St. Louis serum and certain contaminated cow-pox vaccines recently used in New Jersey have frightened many people into the belief that these substances are inherently dangerous. This is not true! Skilfully and carefully prepared serums are harmless in the hands of a competent physician. The danger of contracting tetanus through cow-pox vaccine is very remote. The cow is the most nearly immune of all our domestic animals.

As the vaccine is usually prepared from calves, where ordinary care and antiseptic precautions are taken in collecting and preserving the vaccine, the danger of contamination by the bacillus of tetanus is practically *nil*. Physicians who buy high grade vaccine from responsible and reputable makers can use it without worrying over the danger of its inducing lock-jaw. The danger of getting contaminated diphtheritic antitoxine is much greater than in case of vaccine since this serum is always obtained from the horse, and that animal is very susceptible to tetanus. But when the horse has been previously rendered immune to tetanus there is no danger of getting contaminated antitoxine. In this case, too, only serum prepared by reputable makers should be used. Contamination of serums is always the result of carelessness or lack of skill, which in this case is a crime.

In treating a case of suspected tetanic inoculation the prompt injection of the antitoxine or curative serum is a *sine qua non*. After dyspnea sets in there is scant hope for a favorable termination. A microscopic examination of scrapings from the wound should be made whenever practicable. As has already been said, the bacillus of tetanus forms spores in the living body within twenty-four to thirty hours. In the sporiferous condition this bacillus is easily recognized in a microscopic preparation. As a further precaution the wound should be washed out with a ten per cent. solution of peroxide of hydrogen or five per cent. carbolic acid, acidulated with one-half per cent. glacial hydrochloric acid. The wound should always be kept clean and the formation of pus prevented at all hazards. Without the aid of the pus-forming microbe the

tetanus microbe cannot increase, and there is, therefore, little danger. The wound when it can be excised or burnt out without permanent injury or disfigurement should be so treated as soon as possible after inoculation has occurred. As palliatives and antispasmodics good authorities recommend aconite, belladonna, bromide of potassium, chloral and strychnine.

The writer will make for physicians and veterinarians of North Carolina microscopic examinations of scrapings of wounds suspected of tetanic contamination, if following conditions are strictly observed:

1. The wound should not be less than twenty-four or more than sixty hours old.

2. Use a clean scalpel to scrape the wound. Place the scrapings in a sterile jar or bottle, such as are used in the laboratory for samples of sputum. Enclose the bottle or jar in the official metallic mailing cases furnished by the State Board of Health. These are now deposited with county and city health superintendents, of whom they can be obtained.

3. Seal the case so that it cannot be opened in transit and pay letter postage on sample. There is a heavy fine imposed on any one who sends pathogenic microbes through the mail in any but regular, official mailing cases.

4. Reports on samples of this kind will invariably be made by telegraph at cost of receiver.

5. The following facts must be furnished with samples: Name and address of sender; name, age and sex of patient; situation of wound; day and hour when wound was made; day and hour when wound was scraped; day and hour of mailing sample. Address sam-

ples not to any person, but to North Carolina Department of Agriculture, Division of Biology, Raleigh, N. C.

Review of Diseases for February, 1903.

EIGHTY-EIGHT COUNTIES REPORTING.

Ninety-four counties have Superintendents of Health.

Except in the case of the more contagious and dangerous diseases the Superintendent has, as a rule, to rely upon his own information alone, since few physicians can be induced to report cases of non-contagious diseases to him.

Where the number of cases is not given or the prevalence of a disease otherwise indicated, its mere presence in the county is to be understood as reported.

For the month of February the following diseases have been reported from the counties named:

MEASLES.—Brunswick, many cases; Caswell, 30; Chatham; Cleveland, many; Columbus; Durham, many; Granville, 4; Harnett, a few; Jones, general; Macon, in all parts; Onslow, 30; Randolph, general; Robeson, several; Scotland; Surry, 12; Union, 10; Washington, 6—17 counties.

WHOOPING-COUGH.—Beaufort, 2; Bertie, many; Caswell, 25; Cleveland, a few; Dare, 18; Durham, many; Harnett, many; Hertford, 6; Hyde, 100; Montgomery, 6; Northampton, many; Pasquotank, 2; Perquimans, 14; Randolph, general; Rutherford, a few; Sampson, many; Union, 5; Wake, 25—18 counties.

SCARLET FEVER.—Ashe, 8; Caswell, 3; Craven, 1; Durham, 2; Gaston, 3; Guilford, 2; Haywood, 4; Northampton, 1; Swain, 3—9 counties.

DIPHTHERIA.—Brunswick, many; Cra-

ven, 1; Guilford, 1; Northampton, 1; Rowan, 1—5 counties.

TYPHOID FEVER.—Ashe, 1; Bertie, 1; Bladen, 2; Caswell, 1; Chatham, a few; Columbus, 2; Craven, 1; Dare, 2; Durham, 2 or 3; Granville, 4; Greene, 1; Guilford, 1; Harnett, a few; Haywood, 1; Jones, 1; New Hanover, 2; Orange, 2; Polk, 3; Randolph, 4; Rowan, 1; Stanly; Stokes, 1; Surry, 1; Swain, 3; Union, 12; Wake, 2; Watauga, a few—27 counties.

MALARIAL FEVER.—Bladen; Franklin; Rowan.

MALARIAL FEVER, PERNICIOUS.—Bladen, 2; Rowan, 1.

MALARIAL FEVER, HEMORRHAGIC.—Bladen, 1.

INFLUENZA.—Alamance, Bladen, general; Brunswick; Buncombe, general; Caswell; Chatham; Cleveland; Columbus; Dare; Duplin; Gates, Greene, Henderson, Hertford, general; Jackson, a few; Lincoln, Martin, general; Mitchell; Montgomery; New Hanover, general; Northampton; Onslow, Orange, general; Pender; Person; Robeson; Scotland; Stokes, general; Transylvania; Union, Vance, Wake, general; Warren; Yadkin—34 counties.

PNEUMONIA.—Alexander, in all parts; Alleghany; Bladen, Buncombe, in all parts; Caswell; Chatham, some; Currituck, a few; Dare, 6; Duplin; Franklin, a few; Gaston, some; Gates, many; Greene, in all parts; Harnett, a few; Haywood, in all parts; Hertford, many; Iredell, Martin, in all parts; Mitchell; Montgomery; Northampton; Orange, in all parts; Pender; Person; Pitt; Polk, in all parts; Robeson; Scotland; Stanly, in all parts; Transylvania; Vance, Wake, in all parts; Warren; Wayne; Wilkes; Yadkin—36 counties.

MUMPS.—Caldwell, in all parts; Catawba; Cleveland; Person; Randolph, general; Wilkes, many—6 counties.

ROSEOLA.—Transylvania.

VARICELLA.—Lenoir; Sampson; Scotland; Washington, in all parts.

SMALL-POX.—Buncombe, 20; Cabarrus, 12, in southern part; Carteret, 1; Cherokee, in two families; Cleveland, 1; Duplin, 7; Durham, 2; Forsyth, 3; Gaston, 11; Greene, 3, all well (March 10); Henderson, 8, "only those who escaped vaccination heretofore are now infected";

Iredell, 8; Lenoir, 4; Lincoln, 3; Madison, no new cases. "By prompt measures the disease was confined to two families. One man was convicted and sent to jail for violations of the laws"; Martin, 9, in one family, under control; Mecklenburg, 35; Nash, 1; Rowan, 10, vaccination made compulsory in one section; Rutherford, 10; Sampson, 4; Stanly, 12; Stokes, 3; Wayne, 1; Wilson, 97—24 counties.

CHOLERA, IN CHICKENS.—Clay and Cleveland.

CHOLERA, IN HOGS.—Caswell, Columbus, Currituck, Hertford and Scotland.

STAGGERS, IN HORSES.—Greene, Hertford, Hyde and Pasquotank (?)

No diseases reported from Chowan, Clay, Cumberland, Davidson, Edgecombe, Johnston, McDowell, Madison and Yancey.

No reports received from Alleghany, Graham, Halifax, Moore, Richmond and Rockingham.

Summary of Mortuary Reports for February, 1903.

(TWENTY-NINE TOWNS).

	White.	Col'd.	Total.
Aggregate population.....	91,620	62,800	154,420
Aggregate deaths.....	94	106	200
Representing temporary annual death rate per 1,000	12 3	20 2	15.5

Causes of Death.

Typhoid fever.....	0	2	2
Malarial fever.....	0	1	1
Diphtheria.....	1	0	1
Pneumonia.....	20	21	41
Consumption.....	11	16	27
Brain diseases.....	5	2	7
Heart diseases.....	11	8	19
Neurotic diseases ..	4	9	13
Diarrhœal diseases	5	4	9
All other diseases..	33	39	72
Accident.....	3	2	5
Suicide.....	1	2	3
	94	106	200

Deaths under five years.. ..	21	22	43
Still-born....	7	12	19

Mortuary Report for February, 1902.

TOWNS AND REPORTERS.	RACES.	POPULATION.		TEMPORARY ANNUAL DEATH RATE PER 1,000.															Total Deaths.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
		By Races.	Total.	By Races.	Total.	Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrheal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	By Races.	By Towns.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							

N. B.—The reporters for the cities and towns printed in **Black Type** have signed this certificate: "I hereby certify that this report gives the *whole* number of deaths occurring within the corporate limits during the above month." The total populations are taken from the census report for 1900, but the division into races is estimated, as those figures have not been given out.

County Superintendents of Health.

Alamance	Dr. H. R. Moore.	Jones.....	Dr. S. E. Koonce.
Alexander	Dr. C. J. Carson.	Lenoir	Dr. C. L. Pridgen.
Alleghany	Dr. B. C. Waddell.	Lincoln	Dr. T. F. Costner.
Anson	Dr. J. H. Bennett.	McDowell	Dr. B. A. Cheek.
Ashe.....	Dr. J. W. Colvard.	Macon	Dr. F. L. Siler.
Beaufort	Dr. Jno. G. Blount.	Madison	Dr. Jas. K. Hardwicke.
Bertie	Dr. H. V. Dunstan.	Martin.....	Dr. W. H. Harrell.
Bladen.....	Dr. L. B. Evans	Mecklenburg.....	Dr. C. S. McLaughlin
Brunswick	Dr. J. A. McNeill.	Mitchell.....	Dr. V. R. Butt.
Buncombe	Dr. E. B. Glenn.	Montgomery	Dr. M. P. Blair.
Burke.....	Dr. J. L. Laxton.	Moore.....	Dr. Gilbert McLeod.
Cabarrus.....	Dr. R. S. Young.	Nash	Dr. J. P. Battle.
Caldwell	Dr. A. A. Kent.	New Hanover	Dr. W. D. McMillan.
Camden.....		Northampton.....	Dr. H. W. Lewis.
Carteret	Dr. F. M. Clark.	Onslow.....	Dr. E. L. Cox.
Caswell	Dr. S. A. Malloy.	Orange.....	Dr. D. C. Parris.
Catawba	Dr. Geo. H. West.	Pamlico.....	
Chatham.....	Dr. H. T. Chapin	Pasquotank	Dr. J. E. Wood.
Cherokee.....	Dr. J. W. Patton	Pender.....	Dr. R. J. Williams
Chowan.....	Dr. T. J. Hoskins.	Perquimans	Dr. C. C. Winslow.
Clay	Dr. J. O. Nichols.	Person	Dr. J. A. Wise.
Cleveland	Dr. B. H. Palmer.	Pitt.....	Dr. C. O'H. Laughing-
Columbus.....	Dr. I. Jackson.		house.
Craven.....	Dr. N. H. Street.	Polk	Dr. Earle Grady.
Cumberland.....	Dr. Jno. D. McRae.	Randolph	Dr. S. A. Henley.
Currituck	Dr. H. M. Shaw.	Richmond.....	Dr. Wm. P. S. Webb.
Dare	Dr. W. B. Fearing.	Robeson	Dr. H. T. Pope.
Davidson	Dr. Joel Hill.	Rockingham	Dr. Sam Ellington.
Davie	Dr. James McGuire.	Rowan	Dr. W. L. Crump.
Duplin	Dr. O. F. Smith.	Rutherford.....	Dr. T. B. Twit y.
Durham	Dr. N. M. Johnson.	Sampson.....	Dr. R. E. Lee.
Edgecombe	Dr. L. L. Staton.	Scotland	Dr. A. W. Hamer.
Forsyth.....	Dr. John Bynum.	Stanly	Dr. V. A. Whitley.
Franklin	Dr. E. S. Foster.	Stokes	Dr. W. V. McCanless.
Gaston.....	Dr. J. H. Jenkins.	Surry	Dr. John R. Woltz.
Gates.....	Dr. W. O. P. Lee.	Swain.....	Dr. J. A. Cooper.
Graham	Dr. R. J. Orr.	Transylvania	Dr. C. W. Hunt.
Granville	Dr. S. D. Booth.	Tyrrell.....	
Greene.....	Dr. Joseph E. Grimsley.	Union	Dr. John M. Blair.
Guilford.....	Dr. Edmund Harrison.	Vance.....	Dr. Goode Cheatham.
Halifax	Dr. I. E. Green.	Wake.....	Dr. J. J. L. McCullers.
Harnett.....	Dr. O. L. Denning.	Warren.....	Dr. A. S. Pendleton.
Haywood	Dr. S. B. Medford.	Washington	Dr. W. H. Ward.
Henderson	Dr. J. G. Waldrop.	Watanga.....	Dr. T. C. Blackburn.
Hertford	Dr. J. H. Mitchell.	Wayne.....	Dr. Williams Spicer.
Hyde	Dr. E. H. Jones.	Wilkes.....	Dr. W. P. Horton.
Iredell	Dr. Henry F. Long.	Wilson.....	Dr. W. S. Anderson.
Jackson.....	Dr. Wm. Self.	Yadkin	Dr. S. L. Russell.
Johnston	Dr. L. D. Wharton.	Yancey	Dr. J. L. Ray.

[You are asked to fill out and mail one of these forms to the Superintendent of Health of your county on or before the third of each month, that he may use it in making his report to the Secretary of the State Board.]

Have any of the following diseases occurred in your practice during the month just closed. If so, state number of cases.

Whooping-cough ----- Typhoid Fever -----

Measles ----- Typhus Fever -----

Diphtheria ----- Yellow Fever -----

Scarlet Fever ----- Cholera -----

Pernicious Malarial Fever ----- Smallpox -----

Hemorrhagic Malarial Fever ----- Cerebro-spinal Meningitis -----

What have been the prevailing diseases in your practice?

Has any epidemic occurred among domestic animals? If so, what?

What is the sanitary condition of your section, public and private?

General Remarks: -----

----- M. D.

RECEIVED
NORTH CAROLINA
STATE BOARD OF HEALTH



